BOSTON UNIVERSITY

SCHOOL OF EDUCATION

Dissertation

A DETERMINATION OF CONCEPTS OF HEALTHFUL LIVING WHICH ARE OF FUNCTIONAL VALUE IN CONTRIBUTING TO THE GENERAL EDUCATION OF ELEMENTARY SCHOOL PUPILS

Submitted
by
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CHAPTER I

THE NATURE OF THE PROBLEM

There is rather general agreement among educators that health is a desirable objective and that research directed toward its enhancement should be pursued. The health of the school child has become a matter of primary interest of elementary school specialists.

Today the curriculum in health education should be designed to meet the health needs, problems, and interests of the individual child. It should aim to provide guidance in the process of growth and development of the school child through healthful living and to develop critical self-knowledge in regard to his own behavior in health.

The present study was undertaken in part to provide a body of useful information that will help to integrate the health content in the curriculum to the end that it may function in the present and future lives of the millions of children now attending elementary schools.

<u>Statement of the Problem</u>. It is the purpose of this study to determine by objective methods, those concepts of healthful living which are of functional value in contributing to the general education of elementary school pupils.

<u>Importance of the Study</u>. Although the roots of health education extend into antiquity, the movement received its greatest impetus during the past decade.

At the International Health Conference held in 1941 some sixty-four

nations of the world signed the constitution of the World Health Organization. One of the first tasks that befell the organization was to adequately define in simple terms the meaning of the word health. Prior to this time each author in the field, indeed each professional health teacher, proclaimed his own definition of the term in line with his own particular philosophy of thought. The World Health Organization defined the term health as "a state of complete physical, mental, and social well-being, not the mere absence of disease or infirmity."[1] This definition is a recognition by sixty-four nations that the necessary equipment for the health of the individual has changed, and that social well-being, or the ability to live in harmony with other peoples is a component part of the term "health."

The constitution of the World Health Organization also includes a statement which suggests a new importance in child health. It states, "Healthy development of the child is of basic importance. The ability to live harmoniously in a total changing environment is essential to such development."[2]

For many years the schools' interest in health has increased and broadened. In 1918 the important place of health in the school program was recognized and was verbalized by a famous report on the "Cardinal Principles of Secondary Education" by a commission of the National Education Association which placed health near the top of the list of seven major objectives of

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[1] Final Acts of the International Health Conference. (New York: United Nations, Lake Success, 1946), p. 9.

[2] Ibid., p. 9.

education.

In 1938 the Educational Policies Commission, in its discussion of the objectives of self-realization, stated three ways in which a person should be health educated:

1. The educated person understands the basic facts concerning health and disease.
2. The educated person protects his own health and that of his dependents.
3. The educated person works to improve the health of the community.[3]

Irwin states that, " . . . the health and physical welfare of the school child is a primary objective of modern education."[4]

One of the best statements of the objectives of general education is found in a publication, A Design for General Education, prepared by the American Council on Education, which states, "In the Committees' judgement, general education should lead the student to improve and maintain his own health and take his share of responsibility for protecting the health of others."[5] Turner states the schools' responsibility in yet another way, "The school has a triple responsibility in the field of health. To build or promote the health of children, to protect them from disease and ill health, and to aid in securing the prompt correction of such physical defects and illnesses as exist or develop in spite of the two first mentioned

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[3] Educational Policies Commission: Purposes of Education in American Democracy (Washington, D. C.: National Education Association, 1938).

[4] Irwin, Leslie W., Curriculum in Health and Physical Education (St. Louis: C. V. Mosby Company, 1947, p. 21.

[5] American Council on Education: A Design for General Education (Washington, D. C., 1949).

activities."[6]

It is clear that education has a responsibility in preparing the child for healthful living. The following discussion will survey the present status of child health and indicate the importance of the study.

Although health conditions in general throughout the United States have improved tremendously during the past fifty years, yet we still face serious health problems.

In 1930 President Hoover addressed the White House Conference on Child Health and Protection. He stated that " . . . in the United States there were forty-five million school children, of whom thirty-five million were reasonably normal. However, six million were improperly nourished, one million had speech defects, one million had weak or damaged hearts, 675,000 exhibited behavior problems, 450,000 were mentally retarded, 382,000 were tuberculous, 340,000 had impaired hearing, 300,000 were crippled, 50,000 were partially blind, 18,000 were totally deaf, and 1,400 were totally blind." In addition he stated that " . . . 20,000 school children were delinquent and 500,000 dependent on charitable organizations or the state."[7]

The downward trend in mortality has been very sharp in the childhood ages. Children have benefited to an extraordinary extent from the progress made by health and welfare agencies in reducing the toll of preventable death. Every one of the leading causes of death in childhood has shown a marked decline during the past decade.

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[6] Turner, C. E., School Health and Health Education (St. Louis: C. V. Mosby Company, 1947), p. 21.

[7] "The White House Conference on Child Health and Protection," The Journal of the American Medical Association (Vol. 95, 1930), p. 1765.

The causes of death during childhood are very different from those of all ages statistically combined. There is also a distinctive pattern for the pre-school age groups as compared with the school-age group. In infancy, premature birth, congenital defects, and injury at birth account for more than half of the deaths.[8] Other important causes are respiratory diseases and diarrhea.

At ages one to four, respiratory diseases cause more deaths than any other condition. Accidents closely follow. Congenital defects and diarrhea are also among the principal causes of death in this age group. None of the communicable diseases of childhood is of major importance as a cause of death and even in the aggregate these diseases account for less than half as many deaths as accidents.

Among children of school age accidents far out-number all other causes of deaths. Motor vehicle accidents represent the greatest in this group. At ages fifteen to nineteen, tuberculosis is the leading cause of death from disease, and heart disease is in second place.

The principal causes of death in infancy and childhood are shown in Table I.

Continuously since 1921, careful studies have been made by the United States Public Health Service, of the common causes of illness prevailing among school children in Hagerstown, Maryland -- a typical small American city with a population slightly over 32,000.

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[8] Wilson, Charles C., Health Education (National Education Association of the United States, Washington, D. C., 1948), p. 35.

TABLE I

THE CHILD KILLERS

(Leading causes of deaths in Infancy and Childhood for 1946)[9]

Age and Cause of Death	Number
Under 1 Year	
All causes	111,063
Premature Birth	39,824
Congenital Malformations	14,912
Pneumonia (all forms) and Influenza	12,657
Injury at Birth	11,738
Diarrhea, Enteritis, and Ulceration of Intestines	5,498
All other causes	26,434
1-4 Years	
All causes	19,679
Pneumonia (all forms) and Influenza	3,657
Motor vehicle accidents	1,413
Congenital Malformations	1,251
Tuberculosis (all forms)	894
All other causes	9,236
5-14 Years	
All causes	17,948
Accidents (excluding motor vehicles)	4,037
Motor vehicle accidents	2,508
Pneumonia (all forms) and Influenza	1,131
Diseases of heart	1,036
Tuberculosis (all forms)	747
All other causes	8,489
15-24 Years	
All causes	37,729
Motor vehicle accidents	7,445
Tuberculosis (all forms)	6,065
Accidents (excluding motor vehicles)	5,921
Diseases of the heart	2,300
Homicide	1,669
All other causes	14,329

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[9] National Office of Vital Statistics, Federal Security Agency, (United States Public Health Service, Vol. 29, No. 1, 1948), p. 21.

Statistics from 1940 to 1945 show that the number of days absence during a school year on account of sickness average 849 per 100 children. Children under eight years of age were absent on account of illness nearly twice as much as other children fourteen and over.

TABLE II

SICK AND OUT OF SCHOOL

(Days of absence from sickness per 100 children in)
(a school year in Hagerstown, Maryland, schools.)
(White children only.[10])

	All Ages	Under 8	8-9	10-11	12-13	14 and over
1923-1925	738	1068	789	627	610	523
1939-1940	824	1260	893	721	738	655
1940-1945	849	1179	869	822	791	660

The illnesses which cause the most absences from school are tonsillitis and respiratory infections, including the common cold. Minor disorders of the digestive tract, headache, toothache, earache, and accidents are other frequent causes of absence.

This brief survey of the present status of child health has several important implications for this study. A review of the vital statistics indicates that life is becoming progressively safer for children. Every one of the leading causes of death to children has shown a marked decline in the

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[10] Altman, I., and Ciocco, A., School Absence Due to Sickness in the War Years, (Child Development, 16:4, December, 1945), p. 189.

period under review. Truly phenomenal have been the accomplishments of the past decade in reducing the mortality and improving the general health of children of school ages. In 1900[11] the death rate for children 5-14 years of age was 3.9 per 1,000; at the present time it is less than 0.9 per 1,000. Yet the present low death rate can be further reduced, and this is one of the primary tasks of health education. This statement is significant because accidents are at the top of the list and accidents for the most part are preventable.

As the causes of death and disability in children are being reduced, more and more attention needs to be focussed on other important factors in child health, such as dental defects, mental and social health, nutrition and other disorders.

Well-motivated health education in the school program can go a long way toward helping the children to take the responsibility for their own health.

This is the goal of all teaching and the true test of all learning. It is the purpose of this study to contribute to the health instruction program of the elementary school by determining concepts of healthful living that will assist children in taking over the responsibility for their own health to the extent that it is possible for them to do so.

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[11] National Office of Vital Statistics; Federal Security Agency (United States Public Health Service).

Definitions of Terms Used.

Concepts[12] Teachers' goals. Recognizable advances in educative growth to be made by the pupils.

Deduction[13] The technique of reasoning or problem solving that consists in applying general rules to particular cases, in coming to conclusions about specific instances through the logical consideration of generalities.

Disease[14] Reaction to injury.

Elementary School[15] A school for children of elementary school age that normally requires six years to complete the work provided.

Health[16] Health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity.

Induction[17] A method of reasoning about generalities through the examination of particulars.

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[12] Billett, R. O., *Secondary School Teaching* (Boston, Houghton Mifflin Company 1940) p. 273.

[13] Good, Carter V., *Dictionary of Education* (New York, McGraw-Hill Book Company 1945). p. 121.

[14] Forbus, W., *Reaction to Injury* (Baltimore, Williams and Wilkins Company 1943) p. 42.

[15] Good, *op. cit.* p. 149.

[16] Final Acts of the International Health Conference (Lake Success New York United Nations 1946) p. 9.

[17] Good, *op. cit.* p. 215.

CHAPTER II

THE REVIEW OF THE LITERATURE AND RESEARCH

Curriculum in the Elementary School. Lee and Lee[1] state that, "Any system involved in a program of curriculum development should have guides." They offer the following statements as guides:

> 1. The curriculum is considered to be the actual experience of each pupil which is affected by the school.
>
> 2. Curriculum improvement is conceived as a process of improvement of teachers in the guidance of pupil experiences.
>
> 3. Curriculum development is a continuous process carried on within each school system.
>
> 4. Existing subjects do not necessarily constitute the best organization of pupils experiences.
>
> 5. Careful consideration should be given to the utilization of the guiding principles for the selection and guidance of pupil experience.

Reavis[2] suggests that the main objectives of the health program for elementary school children should be:

1. Useful knowledge regarding health.
2. Formation of fundamental health habits.
3. Correction of causes and effect of wrong health habits.
4. Prevention of communicable diseases.

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[1] Lee, J. M., and Lee, D. M., The Child and His Curriculum (New York: Appleton-Century-Crofts Inc., 1940), pp. 186-187.

[2] Reavis, Pierce, and Stullen, The Elementary School (University of Chicago Press, 1931), p. 239.

Billett[3] states, "In many elementary and secondary school curricula one finds that important concepts receive no systematic attention in the elementary school grades." This statement by an outstanding authority in the field of general education helps to justify the need for this particular investigation, for health education has been too often neglected in the elementary school teaching and it is at this level that the foundation of healthful habits of living begin to accrue.

In support of the question of grade placement of these concepts of healthful living Billett[4] states, "The teacher must learn to expect and to plan for slow sequential growth in important concepts over a period of years-in some instances, over the entire period of elementary and secondary school education."

A committee representing the American Association for Health, Physical Education and Recreation[5] has recently drawn up a platform upon which curriculum builders may base their planning. They suggest, "Health instruction based upon scientific materials progressively arranged throughout the grades and upper schools, and directed toward personal accomplishment and social ideals. Safety Education should be included in this instruction."

If curriculum development is conceived as a process of the improvement of teachers in the guidance of pupil experiences, we have new meaning for

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[3] Billett, R. O., Fundamentals of Secondary School Teaching with Emphasis on the Unit Method (Boston: Houghton-Mifflin, 1940) p. 143.

[4] Ibid, p. 143.

[5] The Subject Fields in General Education (New York: D. Appleton-Century Co., 1940) p. 26.

the identification and determination of health concepts at the elementary school level. These concepts can very well be conceived of as teachers' goals and included in the unit of learning[6] sequence.

Bruner[7] states, "The tendency is toward the abandonment of the practice of listing large numbers of specific objectives at the beginning of a course. Instead, there are appearing at the beginning of the course general statements of aims in the form of themes, concepts, or generalizations."

Curriculum in Science Education. The identification and determination of principles for teaching purposes had an early beginning in the field of science education. An examination of the literature and research reveals a tremendous amount of pioneer work in this area. Because the field of health is deeply rooted in the findings of the biological sciences, it is interesting to note that research in science education has paved the way for the further investigation in the educational aspects of health education. A debt of gratitude is owed to these science educators for the revelation of techniques that are also applicable for the determination of concepts or understandings in the field of health education.

In a study conducted as far back as 1927, Craig[8] maintained that,

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[6] Billett, op. cit., p. 504.

[7] Bruner, H. B., Curriculum Making in Current Practice, (Northwestern University), p. 32.

[8] Craig, Gerald S., Certain Techniques Used in Developing a Course of Study in Science for the Horace Mann Elementary School (Teachers College contribution to Education V. 276 N.Y. Teachers College, 1927) pp. 56-57.

"Certain objectives that are selected for a course of study in elementary school science should conform to those factors, principles, generalizations, and hypotheses of sciences which are essential to the interpretation of common natural phenomena of the environment of man." This early study suggests the importance of determining objectives for the teaching of a course of study at the elementary school level. It also reveals that properly determined objectives should conform to principles that are functional in their application. In contrast to this study in science education Downing[9] stated that, "if he is to lead pupils into healthful ways of living, he must give them an understanding of the important principles or laws of health." The understandings of Downing conform in principle to the concepts of the present investigator.

Martin[10] in an article found in Science Education states,

> In 1931, Wilbur under the direction of Curtis at the University of Michigan made an investigation to determine scientific principles contained in textbooks of general science published between 1924 and 1931. In this study the criteria for the determination of a principle were formulated by six graduate students in a Seminar in Problems in the Teaching of Science.

This statement by Martin is offered in partial justification for the source of criteria used in the present study. Other investigators in the field of science education utilizing similar techniques conducted studies in the area of the physical sciences.

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[9] Downing, Elliot, R., An Introduction to the Teaching of Science, (Chicago: University of Chicago Press, 1934), p. 6.

[10] Martin, W. E., A Chronological Survey on Research Studies on Principles, (Science Education XXIX, February, 1945), pp. 45-59.

In 1941, Wise[11] set out to determine those principles of physical science that were most important for general education. The criteria he used were similar to those employed by other research workers.

In 1943 Reek[12] embarked on a follow-up study to determine whether or not the ideas propounded by the Thirty-First Yearbook had taken effect on current writers of textbooks. The findings were negative and indicated that textbooks of science designed and prepared for the elementary school level had not kept the pace with improved methods of pedagogy as indicated by current research.

In 1946 Jones[13] analyzed seven ninth-grade general science textbooks for scientific principles. In 1947, Leonelli[14] conducted a Master's study and analyzed eight textbooks of general science, Grade VIII, for principles of Physical and Biological Science.

A careful examination of the Thirty-First Yearbook and studies conducted at the University of Chicago, University of Michigan, University of Minnesota, Columbia University, New York University, Ohio State University

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[11] Wise, Harold, E., A Determination of the Relative Importance of Principles on Physical Science to General Education, (unpublished Doctor's dissertation, University of Chicago, 1941), p. 8.

[12] Reek, Doris, L., A Study of Principles of Science Found in Four Series of Textbooks of Elementary Science, (unpublished Master's thesis, University of Michigan, 1943).

[13] Jones, Ruth, V., A Study of the Principles of Science Found in Ninth Grade Textbooks of General Science, (unpublished Master's thesis, University of Michigan, 1946).

[14] Leonelli, Renato, E., Principles of Physical and Biological Science Found in Eight Textbooks of General Science for Grade VIII, (unpublished Master's thesis, Boston University School of Education, Boston 1947).

and Boston University justify the identification of science principles as a major function of curriculum planners. The background of research and techniques used in the solution of the problems encountered in the field of science education paves the way for much needed investigation and research in the related field of health education at the elementary school level.

Curriculum in Health Education. The stated purpose of this study is to determine concepts of healthful living that have functional value for the elementary school. The purpose of the study may be supported by reference to Billett[15] who, in recording the prerequisites for the most effective teaching at the elementary and secondary school levels states in part:

> Since education growth is basically growth in concepts and skills, it seems self-evident that teachers can never promote theeducative growth of pupils most effectively until the following tasks have been performed as well as possible: the identification of the concepts and skills which are essential to, or consistent with, successful, happy, and socially desirable behavior in a democracy . . .

It is the express belief of the investigator that this task has never been performed at the elementary school level. The author is aware of the study completed by Staton at the secondary school level in the field of health education. This was a pioneer study and a considerable contribution to the field of health education at the secondary school level.

The investigator of the present study is keenly aware of the words of Chenoweth and Selkirk,[16] who in their text adequately summarize:

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[15] Billett, op. cit., p. 150.

[16] Chenoweth, L. B., and Selkirk, T. K., School Health Problems (New York, F. S. Crofts, 1946), p. 369.

1. A justification of the problem and

2. One method of selecting facts for health instruction.

They state,

> A new examination of the facts now taught needs to be made in order to see what is omitted that should be taught, to relegate to the proper places those things that are of minor importance and to eliminate the things that are not true. Some of the things now taught do not have health value in keeping with the prominent place they occupy in teaching . . .

and they further state,

> A very different approach lies in the consideration of the subjects of death and sickness for the uncovering of materials suitable for teaching, the causes of death and sickness are of major importance to the health of the nation. An examination of them should be made as a means of selecting facts to be taught.

The investigator has made use of morbidity and mortality statistics for the purpose of uncovering information that has real meaning for teaching. The vital statistics clearly point out in no uncertain terms that the program of safety education must receive more stress at the elementary school level.

In justifying the inclusion of safety material with that of health it might be well to suggest here the choice in definitions for the word disease.

According to Forbus,[17] "Disease is simply reaction to injury." If we accept this definition by the eminent professor of pathology at Duke University we find that traumatic conditions which occur in accidents may be truly classified as disease.

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[17] Forbus, W., Reaction to Injury (Baltimore Williams and Wilkins Co., 1943), p. 42.

Grout[18] defines Health Education as "the translation of what is known about health into desirable individual and community behavior by means of the educational process."

If we accept her definition of the term health education we find three ingredients in the health education process, which are applicable to the elementary school:

1. Basic health concepts
2. Ultimate health goals
3. The educational process

That a well organized and executed program of health education at the elementary school level will bring about desirable changes in behavior is evident from the conclusions drawn from the published report of the Malden study,[19]

> Given a fair but experimental and critical trial, without any initial investment of funds from outside sources, health education commended itself to the school authorities, teachers and parents as a sound procedure, contributing to general education and worthy of adoption as a part of the public school program. In the judgment of physicians and nurses, health education was a benefit to medical and nursing services.
>
> The program resulted in an improvement of habits, attitudes, and knowledge.

Over a period of 20 months, growth records were carefully and accurately taken of 273 children under the influence of a reasonably intensive health education program and of 202 children in a comparable control group who contributed the usual school program without any special

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[18] Grout, R. E., Health Teaching in Schools (Philadelphia, W. B. Saunders Co., 1948), p. 69.

[19] Turner, C. E., School Health and Health Education (St. Louis, C. V. Mosby Co., 1947), p. 119.

training in health beyond that previously given.

> The rate of gain in height and weight for the children receiving health education was measurably and significantly greater than for those in the control group. More healthful habits of living resulted from the health education program, produced an improved rate of growth but not a fundamental change in the height-weight ratio.[20]

O'Neil[21] suggests one point of view underlying the school health program by stating,

> Furthermore, since living must include learning, if we guide children in healthful living, we are at the same time setting up and using a body of health content on subject matter which is adequate to meet their health needs. Accordingly, so far as we can, it is essential that we base our health curriculum on the actual experiencing of children, and thus make health learning an integral part of their every day living in home, school, and community. Such a program includes, perforce, the gradual development of a background of scientific knowledge which will rationalize the healthful behavior of the children as they advance in maturity.

This point of view of the supervisor of health teaching at the New York State Department of Education necessitates cooperative and careful planning by school, home and community, of a unified twenty-four hour-a-day program of experiences through which children may live healthfully and grow physically, mentally, and socially - a program which will meet the health needs of the whole child.

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[20] Ibid, p. 119

[21] O'Neil, F. C., A Guide to the Teaching of Health in the Elementary School (Albany, The University of the State of New York Press, 1941), p. 14.

CHAPTER III

THE RESEARCH PROCEDURE AND TECHNIQUES USED

Logical analysis. For purposes of analysis the study was divided into two major parts, the inductive phase and the deductive phase.

1. Inductive Phase. The purpose of the inductive phase was to determine a list of fundamental concepts of health education that would be of functional value in contributing to the general education of the elementary school pupils. This phase of the study had four sub-problems.

   Sub-problem (a) - To select and to determine the important concepts of health education occurring in thirty-six textbooks designed for use in the elementary school.

   Sub-problem (b) - To select and to determine the important concepts of health education occurring in fourteen selected safety text-books designed for use in the elementary school.

   Sub-problem (c) - To select and to determine important concepts of health education for the elementary school level in thirty-six issues of Hygeia Magazine.

   Sub-problem (d) - To select and to determine important concepts of health education from an analysis of vital statistics.

2. Deductive Phase. The purpose of the deductive phase of the study was to determine from the list secured in the inductive phase those concepts that are of importance to the elementary school.

Sub-problem (a) - To determine from the ratings and judgements of representative medical and health authorities the scientific accuracy of the concepts as determined in the inductive phase.

Sub-problem (b) - To determine from the ratings and judgments of representative health and elementary school specialists, which concepts contained in the derived list are essential and suitable as fundamental concepts for health instruction at the elementary school level.

Research Procedure

1. Inductive Phase.

Sub-problem (a) - The content of thirty-six current and authoritative health texts designed for use at the elementary school level was read and analysed for statements of basic concepts of health education. The textbooks were selected on the basis of the following criteria:

1. Up to date
2. Authoritative
3. Part of a series

In order to satisfy the first criterion, the textbook must have been written since 1940. In order to satisfy the second criterion the textbook must have been written by a well-known author, must not have been a first publication, and must have been published by a reliable publishing company. In satisfying the third criterion the book must have been especially designed as a part of an elementary school series

of books for Grades I through VI.

The criteria established for the identification of health concepts are basically the same as used by various investigators of principles in the field of science education. This particular list represents the product of the Seminar in Science Education at the Boston University School of Education. Criteria used for selection of a concept of health education include:

1. Must be a comprehensive generalization or a part of a comprehensive generalization.
2. Must not be a definition.
3. Must be true without exceptions within the limitations specifically stated.
4. Must be stated definitely and/or may be implied in the writings of the author.
5. Must not deal with specific substances.

The following textbooks having satisfactorily met the stated criteria, were used as one fundamental source for the identification of and determination of health concepts.

<u>Safe and Healthy Living Series</u>: Andres, J. M., Goldberger, I. H., Dolch, Marguerite, and Hallock, Grace, Ginn and Co., 1945, Boston

<u>Title</u>:
Spic and Span
The Health Parade
Growing Big and Strong
Safety Every Day
Doing your Best for Health
Building Good Health

<u>Health of Our Nation Series</u>: Brownell, C.I., and Williams, J.F., American Book Co., New York, 1942.

Title:
Well and Happy
Clean and Strong
Fit and Ready
Safe and Sound
Hale and Hearty
Active and Alert

New Health and Growth Series: Charters, W.W., Smiley, D.F., and Strang, Ruth, The MacMillan Co., New York, 1941.

Title:
All Through the Day
Through the Year
Health Secrets
Healthful Ways
Lets be Healthy
Habits Healthful and Safe

Health-Happiness-Success Series: Irwin, Leslie W., Tuttle, W.W., and DeKelver Caroline, Lyons and Carnahan, Chicago, 1947.

Title:
Awake and Away
Growing Day by Day
Keeping Fit for Fun

Burkand, W.E., Chambers, R.L., and Maroney, F.W., Chicago, 1946.

Title:
Building for Good Health
Good Health is Fun
Your Health and Happiness

Health, Safety, Growth Series: Turner, C.E., and Colleagues: D.C. Heath Co., Boston, 1941.

Title:
Growing Up
Keeping Safe and Well
Gaining Health
Cleanliness and Health Protection
Working for Community Health
Building Healthy Bodies

American Health Series: Wilson, C.C., Baker, C.B., Abbot, P.J., Almack, J. C., Bobbs-Merrill Co., N. Y., 1943.

Title:

Our Good Health
Healthy and Happy
Everyday Health
Health at Home and School
Health at Work and Play
Growing Healthfully

The investigator made a very careful page by page analysis of the health textbooks evaluating each concept identified in terms of the stated criteria. Each concept was placed on an individual card with a notation as to exact source. Each textbook was also analyzed for teaching guides and for possible information relative to the gradation of material.

Sub-problem (b)- The content of fourteen current and authoritative safety texts designed for use at the elementary school level were read and analyzed for statements of basic concepts of health education. The same criteria previously established and stated were used for the safety texts. The following textbooks having satisfactorily met the stated criteria, were used as a second fundamental source for the identification and determination of health concepts.

The Road to Safety Series: Buckley, H. M., White, Margaret L., Adams, Alice B., and Silvernale, L. R., American Book Co., Boston, 1942.
Title:
Away We Go (Book A)
Happy Times (Book B)
In Storm and Sunshine (Book C)
In Town and Country
Here and There
Around the Year
Who Travels There

The Safety Sam Series: Bartrug, C. M., Webster Publishing Co., St. Louis, 1943.
Title:
Meet Safety Sam

Safety Sam's Friends
Growing Up with Safety Sam
Tips from Safety Sam
Growing Wise with Safety Sam
Playing Safe with Safety Sam

The investigator made a very careful page by page analysis of the safety textbooks evaluating each concept identified in terms of the stated criteria. The concept was then placed on an individual index card with a notation as to exact source. Each textbook was also analyzed for teaching guides and for information relative to the possible gradation of material.

Sub-problem (c) - The content of thirty-six issues of Hygeia, 1946-1948, were read and analyzed for concepts of health education applicable to the elementary school level. The same criteria were applied and the same tabulation procedure followed. The purpose of this analysis was to uncover any current concepts that may have been based on research more recent than that contained in the textbooks.

Sub-problem (d) - The fourth source of information for the identification and determination of basic concepts of health education was vital statistics. This source was handled last, in order to prevent any possible bias in the selection of concepts. The source of vital statistics was the Federal Security Agency, United States Public Health Service, National Office of Vital Statistics, Washington, D.C. The investigator analyzed vital statistics for the three year period of 1945-1947. The age span of 5-14 was used and is representative of the elementary school level. The following table tabulates the five leading killers of children for

TABLE III

FIVE LEADING CAUSES OF DEATH IN CHILDREN 5-14

(For 1945-1947)[1]

1947 5-14	1946 5-14	1945 5-14
Accidents	Accidents	Accidents
Motor Vehicle Accidents	Motor Vehicle Accidents	Motor Vehicle Accidents
Pneumonia and Influenza	Pneumonia and Influenza	Pneumonia and Influenza
Diseases of Heart	Diseases of Heart	Diseases of Heart
Tuberculosis	Tuberculosis	Tuberculosis

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[1] National Office of Vital Statistics: Federal Security Agency (United States Public Health Service).

the three year span 1945-1947.

In analyzing the data in Table III the first five causes of death in children 5-14 were found to be consistent. The other leading causes of death in children of this age included cancer and malignant tumors, appendicitis, poliomyelitis, nephritis and diphtheria. Appendicitis was the sixth leading cause of death in children 5-14 in 1945, but in 1946 it dropped to the new low of tenth on the list. This may be explained in part by the advent of certain drugs on the market late in 1945. The sulfonamide compounds and penicillium proved to be effective against peritonitis which accounted for so many deaths in children prior to this time. Poliomyelitis is a disease whose etiology and epidemiology is not as yet completely understood. Hence the incident of poliomyelitis among school children varies from year to year. Nephritis is a condition that rates about eighth on the list of children-killers. It is a disease brought about by the presence of irritants in the blood which affect the kidneys. This condition may be secondary to streptococcal infections which lead the causes in morbidity for children of this age. Rheumatic fever of childhood origin is responsible for a major portion of mortality from heart disease in the early and middle adult years. Although the cause of rheumatic fever is yet to be definitely established, the early detection and more adequate treatment of cases will undoubtedly further reduce the toll of death and disability.

A number of diseases which have come under control as causes of death are still important as causes of morbidity. This reflects the fact that, in general, far more has been accomplished in successfully treating than in

preventing diseases among children. Thus the common communicable diseases of childhood, such as, whooping cough, mumps, chicken pox, scarlet fever, diphtheria and the respiratory diseases play a large role among the causes of morbidity.

Active immunization against diphtheria prevents not only the disease, but also those complications and associated conditions with which diphtheria has been associated, including acute myocarditis, nervous lesions, nephritis, and acute otitis media. Hoyne[2] states that the only certain means of eliminating mortality in diphtheria is prevention of the disease and that remarkable success, even in large cities, in stamping out diphtheria is possible when a plan of immunization is well organized and energetically directed. Concurrently Ramon[3] observes that whenever the generalized application of diphtheria toxoid has been correctly and judiciously used in a large number of persons, a considerable reduction in the morbidity and mortality caused by diphtheria has resulted.

Although the immediate mortality from measles is extremely low, the severity of the complications among hospitalized cases is well known. Those who have studied the effects in later life of severe attacks of measles in childhood are unanimous in the belief that much adult ill health is attributable to this disease. Broncho-pneumonia, lobar-pneumonia, and influenzal pneumonia are relatively common in infants and young children following measles.

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[2] Hoyne, A. L., M. Clin: North America (Chicago Number), January 1947, p. 61.

[3] Ramon, G., Bull. Schweiz. Akad. d. med. Wisserscìahter 1:413 (1941): Astu. in Am. J. Dis. Uita. 73:731, June 1947.

Although influenza in itself is not necessarily a fatal disease, it leaves its victims so debilitated that they contract intercurrent infections, usually pneumonia.[4]

A number of studies[5] have demonstrated that immunization with influenza virus vaccine affords a better than three to one chance of protection for a period of several months against the two most prevalent types of influenza.

Although the direct mortality in children from whooping cough is not high, about 25% of infants under six months of age who contract this disease succumb.[6] The incident of broncho-pneumonia associated with, or as a complication of pertussis averaged 47.6% for a ten year period at the Herman Keeler Hospital, Detroit.[7] Other complications that occur with considerable frequency are acute otitis media, albuminuria, and myocardial insufficiency.

Children who are constantly contaminating their minor injuries with soil, should be fully protected against tetanus by means of toxoid immunization. Edsall[8] warns that even under the conditions of western civilization in peacetime the possibility of the occurrence of tetanus bacillus is frequently found in the dirt of city street, and that the possibility of infection with this organism is ever-present.

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[4] Gover, M., Public Health Report (58:1033), July 1943.

[5] Frances, T., Jr., American Journal of Hygiene (42:I), July 1945.

[6] Lapin, J. H., Whooping Cough (Charles C. Thomas, Springfield, Illinois, 1943), p. 17.

[7] Tob, F. H., Handbook of Communicable Diseases (St. Louis C. V. Mosby Co., 1941)

[8] Edsall, G., New England J. Med. (235:256), August 22, 1946.

The National Health Survey[9] showed that at ages 5-9, of the illnesses which last a week or more the common diseases of childhood account for more than half, and the acute respiratory diseases for slightly more than one fifth of the total; the two combined thus being responsible for about three fourths of the illnesses of long duration. At ages 10-14 these two groups of diseases are responsible for almost 30 per cent of the total. Accidents and chronic conditions, on the other hand, are of less consequence in the morbidity than in the mortality record.

Because the incident of accidents rated consistently highest in the list of killers of children, the investigator went to yet another source for further facts and analyzed the findings of the National Safety Council for a period of eight years. "Accident Facts" the official publication of the National Safety Council indicated that in 1948 some 55% of the student accidents occurred under the jurisdiction of the school. That of the school accidents 26% occurred in the school buildings, 22% on the school grounds, and 7% going to and from school. Of the non-school accidents 18% occurred in the home and over 27% in public places. In analyzing the specific causes of these accidents it was well established that of the accidents that occurred in the school buildings the following were most significant: the gymnasium, dressing rooms, showers, the vocational shops, classrooms, stairs, corridors, laboratories. For accidents on the school grounds the following items constitute the major hazards: baseball, soccer, track, apparatus, falls, and

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[9] Britter, R. H., Collins, S. D., and Fitzgerald, J. S., Some General Findings as to Disease, Accidents, and Impairments in Urban Areas, The National Health Survey. Public Health Reports (Washington, D. C., Vol. 55, No. 11, 1940.)

unorganized activity in general. Motor vehicle accidents were most significant in the item of going to and from school. For accidents that occurred in the home falls, burns, scratches, explosions, cuts, and poisons were important. Other hazards included the streets and sidewalks, bicycle riding, and swimming. The following tables will adequately summarize student accidents by type and grade from 1940-1948.

TABLE IV

STUDENT ACCIDENTS BY TYPE AND GRADE

For 1940-1941[10]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	1,407	1,591	1,722	2,140	2,249	2,596
School Buildings	147	104	152	200	281	286
School Grounds	207	260	268	370	378	463
Going to and from School	160	154	137	142	160	155
Home Accidents	520	534	586	639	623	595
Other Accidents	373	534	579	789	807	782

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	2,596	2,315	2,461	1,781	1,396	1,022
School Buildings	623	617	780	536	415	291
School Grounds	430	333	362	330	277	221
Going to and from School	157	137	120	104	58	39
Home Accidents	564	435	396	284	234	152
Other Accidents	822	793	803	527	412	319

[10] Source: Reports for nine months (September, 1940 - March, 1941)-(plus April and May, 1940, to complete a nine-month school year) from school systems with an average enrollment of 866,000. Accidents included are those requiring a Doctor's attention or causing absence of one-half day or more. This information is used with permission of the Editor of Accident Facts, National Safety Council.

TABLE V

STUDENT ACCIDENTS BY TYPE AND GRADES

For 1941-1942[11]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	587	616	707	820	933	1,004
School Buildings	45	45	57	73	100	129
School Grounds	100	105	110	152	169	197
Going to or from School	68	47	63	54	62	72
Home Accidents	202	215	223	242	263	236
Other Accidents	172	204	254	301	339	370

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	1,044	987	1,004	703	550	465
School Buildings	239	246	302	219	160	134
School Grounds	160	160	158	117	94	86
Going to or from School	58	61	51	26	26	24
Home Accidents	217	164	171	108	87	55
Other Accidents	370	356	322	233	183	166

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[11] Source: Based on reports of 26,282 accidents for nine months (September, 1941 - March, 1942 plus April and May 1941, to complete a nine-month school year) from school systems with an average enrollment of 1,004,000 Accidents are those requiring a Doctor's attention or causing absence of one-half day or more.

TABLE VI

STUDENT ACCIDENTS BY TYPE AND GRADE

For 1942-1943[12]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	100%	100%	100%	100%	100%	100%
School Buildings	8.5	8.2	10.2	10.7	12.3	13.7
School Grounds	15.6	15.2	18.8	18.7	18.0	17.9
Going to or from School	12.7	10.3	9.4	7.8	7.4	7.3
Home Accidents	37.8	36.9	32.9	28.6	28.8	27.4
Other Accidents	25.4	29.4	28.7	34.2	33.5	34.7

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	100%	100%	100%	100%	100%	100%
School Buildings	25.9	27.8	34.1	31.7	32.1	31.5
School Grounds	12.3	13.7	12.7	13.2	18.2	18.6
Going to or from School	7.2	6.2	6.1	4.9	6.5	5.5
Home Accidents	21.1	20.7	17.3	19.1	15.6	16.2
Other Accidents	33.5	31.6	29.8	31.1	27.8	28.2

[12] Source: Based on reports of 19,718 accidents for nine months (September, 1942 - March 1943 plus April and May, 1942, to complete a nine-month school year) from school systems with an average enrollment of 936,000. Accidents included are those requiring Doctor's attention or causing absence of one-half day or more.

TABLE VII

STUDENT ACCIDENTS BY TYPE AND GRADE

For 1943-1944[13]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	100%	100%	100%	100%	100%	100%
School Buildings	10.6	12.4	11.8	13.5	14.5	16.5
School Grounds	19.7	21.5	21.0	23.6	22.4	23.5
Going to or from School	15.1	11.6	10.4	9.7	7.5	8.1
Home Accidents	29.8	24.8	25.4	21.4	22.2	19.5
Other Accidents	24.8	29.7	31.4	31.8	33.4	32.4

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	100%	100%	100%	100%	100%	100%
School Buildings	28.6	33.4	37.2	32.2	31.8	32.0
School Grounds	16.0	14.8	14.0	17.0	24.3	25.2
Going to or from School	7.0	5.0	5.1	5.5	4.4	3.7
Home Accidents	17.0	14.0	13.3	15.8	11.0	11.5
Other Accidents	31.4	32.8	30.4	29.5	28.5	27.6

[13] Source: Based on reports of 16,618 accidents for nine months (September, 1943 - March, 1944 plus April and May of 1943, to complete nine-month school year) from School systems with an average enrollment of 952,082. Accidents included are those reuiring a doctor's attention or causing absence of one-half day or more.

TABLE VIII

STUDENT ACCIDENTS BY TYPE AND GRADE

For 1944-1945[14]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	100%	100%	100%	100%	100%	100%
School Buildings	28.1	29.0	36.5	34.0	31.0	32.4
School Grounds	19.8	19.5	20.8	20.4	19.4	22.9
Going to or from School	12.7	11.5	8.3	9.2	8.7	7.6
Home Accidents	33.5	30.7	32.6	28.0	27.3	22.3
Other Accidents	23.9	26.0	28.9	30.4	33.3	32.3

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	100%	100%	100%	100%	100%	100%
School Buildings	28.1	29.0	36.5	34.0	31.0	32.4
School Grounds	15.5	14.4	15.0	16.2	21.7	28.0
Going to or from School	6.1	7.0	4.5	4.6	3.4	4.0
Home Accidents	21.8	18.2	16.8	15.8	15.5	10.6
Other Accidents	28.5	31.4	27.2	29.4	28.4	25.0

[14] Source: Based on reports of 19,626 accidents for nine months (Sept., 1944-March, 1945 plus April and May of 1944 to complete a nine-month school year) from school system with an average enrollment of 911,094. Accidents included are those requiring a doctor's attention or causing absence of one-half day or more.

TABLE IX

STUDENT ACCIDENTS BY TYPE AND GRADE

For 1945-1946[15]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	100%	100%	100%	100%	100%	100%
School Building	11.4	11.5	11.0	13.4	12.1	15.8
School Grounds	22.7	22.0	21.0	22.1	24.5	23.4
Going to and from school	12.2	9.6	10.8	7.6	6.6	6.3
Home accidents	29.9	28.2	26.9	25.9	22.9	21.6
Other accidents	23.8	28.7	30.3	31.0	33.9	32.9

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	100%	100%	100%	100%	100%	100%
School Buildings	29.9	31.4	40.4	38.4	35.4	34.8
School Grounds	15.2	17.3	15.7	17.4	24.2	27.3
Going to or from school	4.4	4.8	3.4	3.1	3.4	3.5
Home Accidents	18.9	15.2	13.1	12.4	9.8	7.0
Other Accidents	31.6	31.3	27.4	28.7	27.2	27.4

[15] Source: Based on reports of 17,490 accidents for nine months (September, 1945 to March, 1946, plus April and May of 1945 to complete a nine-month school year) from school systems with an average enrollment of 907,228. Accidents included are those requiring a doctor's attention or causing absence of one-half day or more.

TABLE X

STUDENT ACCIDENTS BY TYPE AND GRADE

For 1946-1947[16]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	100%	100%	100%	100%	100%	100%
School Building	10.4	9.5	10.0	12.1	15.0	16.1
School Grounds	18.7	22.6	21.9	22.0	22.3	21.3
Going to or from School	14.1	10.6	8.8	8.9	8.0	7.3
Home Accidents	32.6	31.4	30.1	24.4	22.5	22.6
Other Accidents	24.2	25.9	29.2	32.6	32.2	32.7

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	100%	100%	100%	100%	100%	100%
School Building	27.4	33.3	37.8	41.0	37.4	33.7
School Grounds	16.2	18.1	19.1	19.4	22.4	30.0
Going to or from School	5.5	5.2	4.0	4.5	4.3	3.8
Home Accidents	21.5	16.6	13.2	11.9	10.9	7.4
Other Accidents	29.4	26.8	25.9	23.2	25.0	25.1

[16] Source: Based on reports of 15,712 accidents for nine months (September 1946-March 1947, plus April and May of 1946 to complete a nine month school year) from school system with an average enrollment of 762,369. Accidents included are those requiring a doctor's attention or causing absence of one-half day or more.

TABLE XI

STUDENT ACCIDENTS BY TYPE AND GRADE

For 1947-1948[17]

ELEMENTARY SCHOOL

LOCATION	1	2	3	4	5	6
Total	100%	100%	100%	100%	100%	100%
School Building	12.0	9.0	9.6	12.9	14.3	15.6
School Grounds	21.2	21.8	24.8	23.4	24.7	24.4
Going to or from school	14.4	12.2	8.7	8.6	8.6	8.3
Home Accidents	29.5	28.5	28.5	23.2	20.0	20.5
Other Accidents	22.9	28.5	28.4	31.9	32.4	31.4

SECONDARY SCHOOL

LOCATION	7	8	9	10	11	12
Total	100%	100%	100%	100%	100%	100%
School Building	33.4	31.9	40.3	40.5	38.9	39.0
School Grounds	16.7	19.9	18.4	20.1	25.0	29.8
Going to and from school	6.3	4.8	4.1	4.8	3.5	3.1
Home accidents	15.7	14.3	11.8	9.9	9.7	6.0
Other accidents	27.9	29.1	25.4	24.7	22.9	22.1

[17] Source: Based on reports of 15,145 accidents for nine months (September 1947-March, 1948, plus April and May of 1947 to complete a nine month school year) from school systems with an average enrollment of 743,793. Accidents included are those requiring a doctor's attention or causing absence of one-half day or more.

In checking this body of information for significant items it becomes increasingly apparent that there are certain very definite values emerging from the facts that have meaning for teaching at the elementary school level.

The figures for a period of eight years show that there is a steady increase in accidents in school buildings progressively grades I-VI. This can be explained by reference to the fact that vocational shops, gymnasiums and laboratories are used more frequently at the upper levels. Because this is true, it is suggested that safety education in respect to this area receive increased attention at the upper grade levels.

Another significant fact is that the incident of home accidents increases up to grade four and then decreases through grade twelve.

If we assume this to be correct on the basis of the facts, then it may be significant for teaching at the primary grade level. It is also apparent that the incident of accidents in going to and from school increases up to grade four and then sharply decreases. This suggests once again that grade four may be a pivotal spot for teaching safety material.

In general, accidents increase steadily from grade one through grade six, reach a plateau at grade seven, and then decline steadily through grade twelve. This may suggest that safety education should be included as major part of health instruction at the elementary school level.

After analyzing all pertinent information relative to accidents, an overall check list was created. This list not only contained significant items in regard to safety, but also the most significant items established in analysis of the mortality and morbidity statistics. Each important

disease was analyzed in order to establish etiology, portals of entry and exit, and means of prevention and control. The following check list was used to check concepts, already identified and determined, against the significant items revealed in the vital statistics.

TABLE XII

CHECK LIST OF SAFETY AND HEALTH FACTS

(Based on Analysis of Accident Facts and Vital Statistics)

I. <u>Accidents</u>

1. Accidents in school buildings occur chiefly in the gymnasium, vocational shops, laboratories, and on the stairs.

2. Baseball, soccer, track, falls, and apparatus cause the most accidents on school grounds.

3. Incident of accidents going to and from school lessened by an understanding of the meaning of traffic signals and rules, and learning the safe way to cross an unguarded corner.

4. Learning safety precautions at home; keeping toys and clothing off stairs and away from places where people might fall over them. Learning safety precautions with fire and at play.

5. Appreciating the importance of seeking attention for even minor cuts and abrasions.

6. Safety precautions when swimming.

7. Safety precautions concerning poisons.

II. <u>Pneumonia and Influenza</u>

8. Pneumonia and influenza patients isolated and contacts restricted.

9. Nasal spray of patients prevented from contacting others.

10. General precautions for pneumonia: avoid overcrowding, avoid droplet infection, avoid conditions which lower body resistance.

11. Pneumonia may be complicated by measles, influenza, whooping cough.

12. Exposure to cold may lead to pneumonia.

13. Influenza may result in chronic middle ear infection.

III. <u>Heart</u>

14. Rheumatic fever an infectious disease.

15. Heart disease may be complication of scarlet fever, influenza, septic sore throat, diphtheria.

TABLE XII (Continued)

CHECK LIST OF SAFETY AND HEALTH FACTS

(Based on Analysis of Accident Facts and Vital Statistics)

16. Children with rheumatic heart exhibit murmurs.

17. School program modified to meet needs of child with rheumatic heart.

IV. <u>Tuberculosis</u>

18. Spitting spreads tuberculosis.

19. Hankerchief prevents spread of germs.

20. Pasteurized milk helps to prevent spread of tuberculosis.

21. Tuberculosis patient needs air, rest, and sunlight.

22. Patch test useful in diagnosing tuberculosis.

23. X-ray useful in diagnosing tuberculosis.

24. General conditions which lower resistance to tuberculosis: dissipation, unsanitary living conditions, lack of sunshine, lack of fresh air, measles, whooping cough, typhoid fever.

25. Children contact tuberculosis by exposure.

26. Diet important both in the prevention and treatment of tuberculosis.

27. Children may show no symptoms of illness.

V. <u>Cancer</u>

28. Cause of cancer unknown.

29. Cancer is not hereditary, or contagious.

30. Three accepted treatments for cancer.

VI. <u>Appendicitis</u>

31. Appendicitis caused by bacteria and fecal concretions.

32. Incident of appendicitis decreases with the advent of sulfa-drugs and penicillium.

TABLE XII (Continued)

CHECK LIST OF SAFETY AND HEALTH FACTS

(Based on Analysis of Accident Facts and Vital Statistics)

33. Constipation one symptom of appendicitis.

34. Pain one objective sign of appendicitis.

35. Sudden loss of appetite a possible sign of appendicitis.

VII. <u>Poliomyelitis</u>

36. Isolation necessary for prevention and control of poliomyelitis.

37. Contacts minimized during epidemic.

38. Possibly spread by secretions, insect vectors, water, milk, food.

VIII. <u>Nephritis</u>

39. Nephritis due to irritants.

40. Nephritis often a secondary infection of diphtheria and streptococcal conditions.

IX. <u>Diphtheria</u>

41. Diphtheria a specific infectious disease.

42. Isolation one means of prevention and control.

43. Respiratory system chief portal of entry and exit for causative agents.

44. Diphtheria carriers exist.

45. Shick test diagnostic in nature.

46. Vaccination effective means of prevention.

47. Toxin-antitoxin — a specific adult vaccine.

48. Toxoid used for establishing active immunity in children.

49. Diphtheria serum useful for its curative values.

50. Successful immunization for diphtheria.

TABLE XII (Continued)

CHECK LIST OF SAFETY AND HEALTH FACTS

(Based on Analysis of Accident Facts and Vital Statistics)

51. Overcrowding spreads the disease.

52. Discharges from nose and mouth spread disease.

53. Symptoms include: fever, sore throat, and swelling in the neck.

X. <u>Measles</u>

54. Caused by virus.

55. Portals of entry and exit the nose and mouth.

56. Symptoms include: fever, sneezing, cough, "running" nose and eyes, Koplik spots, and skin lesions.

57. Prevention via immunization.

XI. <u>Scarlet Fever</u>

58. Caused by bacteria.

59. Spread by discharges from mouth and nose.

60. Symptoms include: temperature, sore throat, and vomiting.

61. Patients and contacts isolated.

62. Immunization via antitoxin.

XII. <u>Chicken Pox</u>

63. Probable cause, filterable virus.

64. Characterized by emanation from the mouth.

65. Lesions include surface eruptions.

66. Prevention of infection from scratching.

XIII. <u>Mumps</u>

67. Probable cause, virus.

TABLE XII (Continued)

CHECK LIST OF SAFETY AND HEALTH FACTS

(Based on Analysis of Accident Facts and Vital Statistics)

68. Discharge from mouth.

69. Slight fever, swelling about ears.

XIX. Whooping cough

70. Caused by bacteria.

71. Discharge from mouth or nose. Sneezing or spitting.

72. Vaccination prevents whooping cough.

XX. Cerebrospinal Meningitis

73. Caused by bacteria.

74. Discharge from nose and mouth.

75. Fever, headache, vomiting, stiff neck.

76. Injection of antimeningococcus.

2. Deductive Phase

Sub-problem (a) - The organized list of classified concepts was then submitted to a selected committee of health and medical authorities who judged the concepts for scientific accuracy. In order to meet this criterion, the concepts must have been consistent with current and accepted medical knowledge and research. It was felt necessary to validate these concepts by this method because of the intricate nature of the health material and vital statistics reviewed. Another purpose was served by this method in that all concepts could be presumed accurate and correct before reliability for teaching at the elementary school level was established.

The committee consisted of five members and included:

1. Public Health Specialist
2. Health Education Specialist
3. Pathologist
4. Pediatrician
5. School Physician

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[1] Dr. David L. Belding, Professor of Bacteriology and Experimental Pathology, Boston University School of Medicine.

2 Dr. Leslie W. Irwin, Professor of Health and Physical Education, Boston University School of Education

[3] Dr. Robert P. MacGate, Associate Professor of Pathology, University of Illinois, College of Medicine

[4] Dr. A. D. Bloomenthal, Pediatrician and Obstetrician, Staff Member Waltham Hospital

[5] Dr. Charles Berger, School Physician, Quincy Public Schools

The pathologist was included as a member of the committee because he is a specialist in the cause and nature of disease and the investigator dealt with the etiology of disease in determining health concepts. In order to meet the requirements of this position the pathologist must possess the degree of Doctor of Medicine and be a member of a National Board in Pathology.

The pediatrician was included as a member of the committee because he is a specialist in diseases of children. In order to meet the requirements of this position the pediatrician must possess the degree of Doctor of Medicine and be a member of a National Board in Pediatrics.

The Health Education specialist was included as a member of the committee because he is a specialist in school health education. In order to meet the requirements of this position the health specialist must possess the degree of Doctor of Philosophy and be a qualified health specialist.

The public health specialist was included as a member of the committee because he is a specialist in vital statistics and community health. Criteria for selection of a public health specialist included poseession of a doctorate in public health or equivalent degree and public health experience.

The school physician was included as a member of the committee because he is a constant witness of health service. Criteria for selection of a school physician included possession of the degree of Doctor of Medicine and ten years of experience as a school physician

Sub-problem (b) - On the basis of the findings of the first evaluating committee, the concepts were presumed to be correct scientifically and consistent with current and accepted medical knowledge and research. These concepts were then submitted to two independent juries of experts who were asked to rate the concepts as to their suitability as fundamental concepts for health education at the elementary school level. The committees or juries consisted of:[1]

1. Health Subject Matter Specialist.
2. Specialist in Child Growth and Development.
3. Safety Education Specialist.
4. Health Supervisor.
5. Health Teacher.

Jury 1

[1] 1. Dr. Laurence B. Chenoweth, Director of Student's Health Service, University of Cincinnati, Co-author of "School Health Problems."

2. Dr. G. Laurence Rarick, Associate Professor of Education, Boston University School of Education.

3. Mr. C. M. Bartrug, Superintendent of Schools, Iowa Falls, Iowa, Author of "Safety Sam Series."

4. Miss Grace D. Keenan, Supervisor of Health Education, Brockton School Department.

5. Miss Jean V. Latimer, Teacher Training Coordinator of Health Education, Massachusetts Department of Public Health.

Jury 2

1. Dr. H. F. Kilander, Assistant Specialist for Health Education, Office of Education, Federal Security Agency, Washington, D.C.

2. Dr. Abigail A. Eliot, Director of Nursery Training School of Boston, Instructor of Child Psychology, Boston University School of Education

3. Dr. Frederick A. Meier, Department of Science and Health Education, State Teachers College, Bridgewater.

4. Mr. Edward Wall, Director of Health and Safety Education, Boston Public Schools.

5. Dr. Hazel B. Mileham, Supervisor of Training, State Teachers College, North Adams.

Criteria for selection of the health subject matter specialists included possession of a doctorate, publication of a textbook in health, and adequate teaching experience. Criteria for selection of the child growth and development specialists included, possession of a doctorate, publication of a textbook in health, and adequate teaching experience, and research in child growth.

Criteria for selection of the safety education specialists included possession of a masters' degree, adequate teaching experience, and experience in safety education. Criteria for selection of the health supervisor included possession of a masters' degree, adequate teaching experience, holds a competent supervisory position. Criteria for selection of a health teacher included possession of a masters' degree, adequate teaching experience, and holds a reputable position in the area of teacher training.

The specialists were instructed to rate each concept in strict accordance with the stated criterion according to the following scale:

1. Not at all suited
2. Poorly suited
3. Neither well nor poorly suited
4. Well suited
5. Ideally suited

In order to meet rating number five in the list the concept must be ideally suited as a fundamental concept of health education at the elementary school level. To rate the discrete number of "five" qualitatively the concept must

ideally suit both the health needs and interests of the elementary school pupil. Four represents a concept that adequately suits the health needs of pupils without satisfying the interests of the pupil. Three represents a concept that adequately suits the health interests of pupils without satisfying the health needs of the pupil. Two represents the concept that does not adequately meet either the health needs or interests of the pupil. One represents a concept that is not at all suitable for teaching purposes at the elementary school level.

CHAPTER IV

THE FINDINGS OF THE STUDY

Validation of the Findings. At this point in the study two questions arise: are the concepts of health education identified by the investigator scientifically accurate and consistent with current and accepted medical knowledge and research? and, what is the relative value of the concepts for teaching purposes at the elementary school level?

In order to answer these two important and challenging questions, organized lists of the identified health concepts were submitted to three independent juries of selected experts.

In brief review the first jury consisted of five health and medical authorities who judged the concepts for accuracy of information. The concepts were accepted as being accurate by this jury if they were consistent with current and accepted medical knowledge and research.

The jury consisted of the following members:

1. Pathologist
2. Pediatrician
3. Health Education Specialist
4. Public Health Specialist
5. School Physician

It was believednecessary to validate the concepts by this method because of the intricate nature of the health information and vital statistics reviewed by the investigator. The members of this jury had only one task to perform; to judge each and every concept according to the one stated criterion and to correct any discrepancies noted. Because the jury consisted of authorities from related, but nevertheless individual areas, unanimity of response to each concept by all

jury members was not required nor indeed expected.

On the basis of the findings of the first jury of medical and health authorities, the investigator assumed that the first question had been answered and that the concepts were scientifically accurate and consistent with current and accepted medical knowledge and research.

The lists of health concepts were then submitted to two independent juries of selected subject matter and elementary school specialists, who were asked to answer the second question by rating each concept as to its suitability as a fundamental concept for health education at the elementary school level.

Both juries worked independently and consisted of five comparable members:

1. Subject matter specialist
2. Child Growth and Development Specialist
3. Safety Education
4. Health Supervisor
5. Health Teacher

A five point scale was devised by the investigator and each jury member was instructed to rate each and every concept appearing on the list with a discrete number of one to five, in strict accordance with thestated criterion. The ratings of each concept by members of each jury were tabulated on index cards and also on a large work sheet. The mode, mean, and median were found for each concept by each jury and appear in the APPENDIX. In order to be more precise in answering the second question - -"what is the relative value of the concepts for teaching purposes at the elementary school level?,"it was deemed necessary to list the concepts of health education in rank-order.

The median was selected as the measure of central tendency in an attempt to provide a typical score for arranging the concepts in rank-order. One of the advantages of the median is that it is not affected by the extreme variants which do affect the mean. According to Sorenson,[1] "When the asymmetry of a distribution is caused by extreme measures at either end, the median is the preferable average to use if one wishes to avoid the influence of extreme measures."

Median ratings of both juries for each individual concept were summed and form the basis for the rank-order distribution of the concepts.

It was believed advisable to prepare two individual lists of concepts both in rank-order, but differing in the fact that the first appears in random order so far as subject-matter areas are concerned and the second list is classified into subject-matter areas to facilitate selection and use.

A median rating of seven or better suggests that it is suitable for teaching purposes at the elementary school level. Although this is a somewhat arbitrary set level established by the investigator, yet it is based on the fact that the discrete number of seven does indicate an item that is "well-suited" for teaching purposes at the elementary school level.

In order to study the relative amount of agreement between juries, a scattergram and correlation table was constructed and is reproduced in Table XIII. It is clearly evident from even a casual examination of the scattergram that there is a marked relationship between ratings of the two

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[1] Sorenson, Herbert, "Statistics for Students of Psychology and Education (New York, McGraw-Hill, 1936), p. 85

juries. It should be mentioned here that unanimity of response within an individual jury was not required nor expected because each individual jury consisted of five members, each representing a different area of educational thought.

As a means of correlation between juries taken as a whole, and as a means of measuring the departure of the regression from linearity, the correlation-ratio was used. According to Garrett,[2] "ETA is a more general coefficient than r, as it is applicable when regression is linear as well as when it is non-linear." Peters and Van Voorhis[3] state that, "ETA gives a measure of the extent to which the Y scores for each given value are grouped compactly together and, consequently, indicates the degree to which some law is present in the relation between the X and the Y factors."

In this particular problem the two "η's" were calculated in a correlation-table which was based on the same data as shown in Table XIII. All actual computations appear in the APPENDIX.

η_{yx} (the correlation-ratio, a measure of non-linear relationship in terms of the standard deviation of the means of the Y-arrays)[4] was calculated by the following formula:

$$\eta_{yx} = \frac{\sqrt{\dfrac{\left[\dfrac{(\Sigma y')^2}{f_x}\right]}{N} - C_y^2}}{\sigma_y} = .90$$

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[2] Garrett, Henry E., "Statistics in Psychology and Education" (New York: Longmans, Green and Company, 1947), p. 367.

[3] Peters, Charles C., and Van Voorhis, Walter, R., "Statistical Procedures and their Mathematical Bases" (New York: McGraw-Hill, 1940), p. 312.

[4] *Op. Cit.*, Garrett, p. 370.

TABLE XIII

SCATTERGRAM AND CORRELATION TABLE

RATINGS OF JURY II (y - VARIABLE)	RATING OF JURY I (x - VARIABLE) I	II	III	IV	V	
V		1 (1)	11 (2)	11111 11111 11111 (15)	11111 11111 11111 11111 11111 11111 11111 11111 11111 11111 11111 11111 11111 111 (68)	86
IV		1111 (4)	11111 11111 11111 1111 (19)	11111 11111 11111 11111 11111 11111 11111 11111 11111 11111 1111 (54)	11111 11111 111 (13)	90
III		11111 11111 11111 111 (18)	11111 11111 11111 11 (22)	111 (3)	11 (2)	45
II	1111 (5)	11111 11111 11111 11111 11111 1 (26)	111 111 (3)			34
I	11111 11111 11111 11111 11111 11111 11111 11111 (40)	11111 1111 (9)			1 (1)	50
	45	58	46	72	84	N = 305

The SE of η_{yx} was calculated by the following formula:

$$SE_{\eta} = \frac{(1-\eta^2)}{N-1} = .01$$

η_{xy} (the correlation-ratio, a measure of non-linear relationship in terms of the standard deviation of the means of the X-arrays) was calculated by the following formula:

$$\eta_{xy} = \frac{\sqrt{\frac{\left[\frac{(\Sigma x)^2}{fy}\right]}{N} - c_x^2}}{\sigma_x} = .89$$

The SE of η_{xy} was calculated by the following formula:

$$SE_{\eta} = \frac{(1-\eta^2)}{N-1} = .01$$

In order to determine whether regression was or was not significantly non-linear it was necessary to calculate the "r" from the same data and compare it with the two "η's". The product-moment "r" was found to be .89 ± .01

The two correlation-ratios for this problem were very nearly identical and clearly significant, with η recorded as only slightly greater than the correlation-coefficient — the product moment "r."

Both regressions are very nearly linear, a result confirmed by an inspection of Table XIII and hence the product moment "r" of .89 ± .01 indicates a marked relationship between ratings of Jury I and Jury II.

<u>Concepts of Health Education Listed in Rank-Order.</u>[5]

I. <u>Concepts with Rating 10</u>

1. Avoidance of infection is the best protection against disease
2. Children like to grow
3. Children are expected to grow
4. Regular gain in weight is a sign of health

5. For human beings, growing up means growing in strength as well as size
6. Sunshine is good for all growing boys and girls
7. Sickness sometimes slows growth
8. Bones become longer and stronger as the body grows
9. Safety rules and signs are needed to protect children from accidents
10. Children who are careful are seldom hurt
11. Careful boys and girls find safe places in which to play
12. The fire drill teaches children how to leave the school building safely in case of fire
13. The fireman teaches children to stay away from fires and matches
14. It is best to stay out of water for at least an hour after eating
15. Boys and girls must play carefully on the playground
16. Fires must have air or they will not burn
17. Children should always follow the safest way to and from school
18. One way to avoid accidents in the home is to keep things where they belong
19. A good swimmer always finds out whether there are any rocks or deep holes or other dangerous places to look out for in a new swimming place
20. Policemen help children on the way to school

21. Children must play safe when skating and sliding
22. Hard bumps on the head are sometimes dangerous
23. Children should stay away from strange animals
24. Children should learn to recognize poisonous plants and to avoid them
25. All boys and girls should be vaccinated against smallpox, tetanus, diphtheria and whooping cough
26. The school fountain must be clean for children
27. Animals that are not clean do not belong in the house
28. Clean hands and bodies are safeguards against disease
29. Baths with warm water and soap are indispensable if the skin is to be kept in good condition
30. Colds are catching
31. Measles are catching
32. Children who cover their noses and mouths when they sneeze or cough protect others
33. Head lice are carried from one person's head to another's by hats, combs and brushes
34. A cold that is neglected may spread and cause serious infection
35. Impetigo and scabies are communicable
36. In order to prevent colds children should cover their noses and mouths with handkerchiefs when they sneeze
37. Good teeth are keys to health
38. Milk is the best food for boys and girls

39. Tea and coffee are not good drinks for children

40. Water is essential to life

41. On a cold day it is best to eat a warm lunch

42. Foods are the principal building materials of the body

43. Food should be protected from flies as they may spread disease from person to person

44. Children who are ill should rest in bed

45. After playing, children need rest

46. The younger you are the more rest you need

47. The right kind of exercise trains the muscles and makes them strong

48. Play and exercise every day help the body to get rid of wastes

49. Exercise makes muscles tired and rest or sleep will help build them up

50. Play and exercise improves the appetite and digestion

51. Swimming is an exercise which brings into play every muscle of the body

52. Proper posture allows all the body organs to do their best work

53. Sleep and rest are natural ways by which the body restores its strength and power

54. The amount of sleep needed depends partly on the person's age, the amount of exercise he takes and his general health.

55. A regular hour for going to bed and getting up encourages sound sleep

56. Sleep rests every part of the body and helps it to get ready for the next day's work and play

57. Recreation helps children to grow to be strong and to be healthy

58. Warm clothes prevent heat from leaving the body.

59. Clothes must be worn according to the season of the year

60. Rubbers and raincoats should be removed when indoors, because they do not give the body a good chance to breathe

61. Earache is a sign of trouble and should get prompt attention

62. The doctor cares for children when they are ill

63. The school nurse gives children first aid and helps them with their health needs

64. Children should be vaccinated before they go to school

65. Dirty garbage and manure breed flies

66. Health officers quarantine people who are sick with certain diseases in order to prevent the spread of disease

67. Only a healthy child can realize the maximum value from school experience

68. A sore throat may be the first sign of a cold or of some children's disease

69. The health of every part of the body depends on the health of the whole body

II. Concepts with Rating of 9.

70. Rest helps children to grow

71. Cuts and scratches may be dangerous and should be cared for right away

72. Flies and mosquitoes may carry diseases

73. Most pathogenic bacteria grow best in dark, warm, damp places

74. In order to be healthy, children must wash their hands and faces before eating and wash their hands after going to the toilet

75. There are three serious diseases that one need not have today because of vaccination: smallpox, diphtheria, and typhoid fever

76. Red blood cells carry oxygen to all parts of the body and white blood cells are guards against disease

77. The dentist helps children to care for their teeth

78. Good food helps teeth to grow strong, makes them hard and solid, and prevents aching

79. Nerve endings in the skin give the sensations of touch, heat, cold and pain

80. Boys and girls must eat good food and drink water every day in order to stay alive and grow

81. Food and milk will keep longer if they are kept cold

82. Various foods are necessary to prevent certain diseases

83. In planning meals for a day, it is necessary to make sure that you have enough of all the food materials which the body needs for energy, building and repair and health protection

84. The best milk comes from healthy cows

85. Fruit has a place in every meal

86. A good appetite is a sign of health

87. Healthy people like to eat

88. Sugar is a good energy food because it is digested quickly and supplies energy at once

89. Good posture is a sign of health

90. The tone of the whole body is improved by exercise

91. A child should go to the toilet to get rid of wastes whenever he feels the need

92. The clothing you wear helps to keep the body at the right temperature

93. Clothes should fit the weather as well as the person wearing them

94. Good light is essential for good reading

95. The first essential of healthy school living is to keep the classroom clean

96. A good place to live must be warm and dry

III. Concepts with Rating of 8.

97. All living things are made up of cells

98. Right habits of living improve the general health of the body

99. Growth is marked by fluctuations in pace

100. Growth is rapid at some ages and slow at others

101. Each child is an individual with his own growth and health patterns

102. It is not safe for children to play with sharp tools or machinery

103. Nothing in a first aid kit should be poisonous except tincture of iodine

104. Poisons should be kept where children cannot get hold of them

105. There is no vaccine that guarantees immunity to colds

106. A warm bath before bedtime induces sleep in children

107. Children should breathe only clean fresh air

108. The skin regulates body heat, protects tender parts beneath, and gives us our sense of touch

109. Whooping cough is a dangerous disease caused by bacteria

110. Pinkeye is a catching disease caused by germs

111. A dog bite may carry rabies to children

112. Whooping cough is very catching from the first day when a person seems to have a slight cold until he stops coughing after four weeks

113. Chickenpox lesions occur as tiny waterblisters that rupture easily and cause pitting of the skin

114. The heart beats faster in children than in adults

115. A healthy heart works much better if it has sufficient rest

116. Information concerning sex should be given in reply to a child's question

117. Good meals include some rough food which forces waste from the food tube within the body

118. Cod-liver-oil helps to keep boys and girls healthy and to prevent colds and rickets

119. It is not good to eat between meals

120. Only fresh water is good to drink

121. Unless proper care is taken foods will spoil and become unfit to eat

122. Disease germs grow readily in milk and may cause sore throat, scarlet fever, diphtheria, and typhoid fever

123. Iron helps to give blood its red color

124. Malnutrition causes a person to tire easily and it weakens body resistance to disease

125. It is not wise to include too much sugar in the ordinary diet because sugar satisfies the hunger and destroys the desire for other essential foods

126. Children who have colds should stay in bed

127. The body builds itself up while resting

128. A rested body is better able to defend itself against harmful germs than is a tired body

129. Good posture helps children keep well and strong

130. Posture is important in building a good framework for the body

131. A good seating position helps blood to circulate

132. Good sleeping habits will help a person to get the most out of sleeping hours

133. In general, summer camp is a marvelous experience for the average healthy child

134. Cereal and bread made from whole grains help people to have a bowel movement every day

135. Wastes in the large intestines are the parts of food that the body cannot digest

136. The large intestine can be trained to clear itself of waste material without the aid of medicines

137. Perspiration keeps the body cool and carries off waste materials

138. Wet clothes make the skin cold and may cause sickness

139. When the thermometer says 70 degrees, the air is just about right

140. All living things use air in some way

141. The skin protects the body from heat and cold

142. Steady quiet breathing shows that a person is taking air into the lungs that is needed to keep the blood stream supplied with good fresh oxygen

143. Air should enter the body through the nose rather than through the mouth because the nose is better equipped to prepare air for the lungs

144. A person who is color blind cannot tell which things are colored green, and which are colored red

145. A podiatrist treats simple diseases of the feet

146. The health examination is the first step in any sound health program

147. Good housing is necessary for good health

148. Towels and wash basins in public washrooms or other public places are sources of infection

149. The State Board of Health tests and approves food and water

150. The food inspector guards the public health by making sure that food sold in the stores is clean and fresh and carries no germs

151. Health Departments are interested in preventing and controlling communicable diseases

152. Most falls come from carelessness

IV. Concepts with Rating of 7.

153. Poor color, flabby flesh, or skin eruptions indicate an unhealthy condition and may be symptoms of disease

154. A knowledge of the body, its duties and its care give us the groundwork for a program of healthy living

155. Resting when you are tired is a safety precaution because it saves the body from strain and over-fatigue

156. Bad accidents in camping are usually caused by guns, falls, fire, and water

157. A dog bite should receive prompt attention by a doctor

158. The eyes, ears, nose, mouth, and skin are avenues through which germs may enter the body and cause disease

159. Circulation of the blood to the extremities is influenced by cold weather

160. Poisons from decayed teeth may be carried by the blood

to other parts of the body

161. Raw fruits and vegetables must be washed clean before eating

162. Inside the body foods are changing into simpler forms that can be used for fuel or for the growth and repair of cells

163. The sudden loss of appetite in a normal child usually indicates acute illness

164. Lack of sunlight may cause bones to become weak

165. Vitamins are substances found in certain foods that are needed for health and growth

166. Children must prepare for bedtime in order to go to sleep quickly

167. Children need appropriate rest at different intervals

168. Exercise increases the rate of breathing and also makes the heart beat faster

169. The wastes produced by working cells are picked up by the blood and carried to the kidneys for removal

170. An oculist examines children's eyes and prescribes glasses

171. The American Red Cross teaches people how to give first aid

172. The sounds which come through the stethoscope tell the doctor whether or not a person's heart and lungs are working properly

173. A doctor has many special ways of finding out whether the body is as healthy as it can be

174. Drinking water which is not pure may cause disease

175. Dust clogs the nose, irritates the throat and may predispose to colds.

V. <u>Concepts with Rating 6</u>.

176. There are many differences in height and weight of children of the same age

177. A safety council helps children to prevent accidents

178. Most lives are lost in fires because no preparation has been made for the emergency and the people involved do not know how to act

179. Pollen allergy can be detected by skin tests

180. Dirty feet are good growing places for the mold that causes athletes foot

181. Children with rheumatic heart disease commonly exhibit a murmur, which is a hissing or blowing sound heard with the stethoscope

182. Common ailments such as headache, sore throat, running eyes, nausea, and fever may be early symptoms of a communicable disease

183. A carrier of disease harbors germs in his body without being sick himself

184. Blood vessels consist of three types - arteries, veins, and capillaries

185. Six year molars are important because they grind food during the time that the children's temporary teeth are being replaced with permanent ones

186. The nervous system makes it possible for muscles in many different parts of the body to work together for a common purpose

187. A good breakfast will help children to keep warm on cold mornings

188. Lime is essential for building healthy bones and teeth

189. Vegetables and fruits lose vitamins in cooking

190. Sleep and rest, good meals at regular times, exercise and fresh air, are the best helps to healthy nerves and the brain

191. Anything that helps make children strong and healthy helps them have good posture

192. A straight framework is necessary if bodies are to attain their greatest strength

193. Proper rest after vigorous exercise is necessary in order to get rid of lactic acid

194. Good physical education in school lays a foundation for happy, healthful adult recreation

195. Children's clothing should be light, loose, and easy to clean

196. Mold grows without sunshine and spoils food

197. As long as the body is well and healthy the body temperature remains almost constant

198. Good eye sight is essential in the development of a healthy child

199. Doctors believe that people can do some things to give bodies the best chance to resist colds

200. Speech quality of the voice can be improved

201. The use of filters and chlorine keep the city water supply clear and pure

202. Proper disposal of wastes is important in preventing typhoid fever

VI. Concepts with Rating of 5.

203. A good driver obeys the traffic rules and regulations

204. Severe bleeding must be checked quickly or death soon follows

205. Feeling clean may help children to sleep well

206. The hookworm is a tiny worm that gets into the body by way of the skin of the foot and causes disease

207. Tetanus may follow any wound, even one which seems trivial, but particularly those that are deep, lacerated, and contaminated with dirt

208. When a person is at rest, the pulse rate is usually about 70 beats per minute

209. The brain more than any other part of the body needs a constant supply of blood

210. Irregularly placed teeth should be corrected during childhood by a competent dentist called an "orthodontist"

211. The liver is a storehouse for fuel that the body uses for the production of energy and heat

212. Calcium and phosphorous are two important minerals necessary for the growth of bones and teeth

213. A healthy stomach is a disinfecting station of great value

214. Pork should always be thoroughly cooked to prevent the painful disease called trichinosis

215. Fresh vegetables and fruits protect the body against scurvy

216. Good posture should be a habit

217. Chest expansion should increase with growth

218. Overwork and over fatigue when accompanied by little rest and sleep form a combination of factors that weaken the body's resistance to disease

219. The structure of the eye is like that of a camera

220. Air which is set into motion by vibrations produces sound waves

221. The smallest thing that should be put into the ear is the elbow

222. A health examination every year helps a person to keep well and strong

223. The safest procedure to follow when there is pain in the abdomen is to stay in bed and call a doctor

VII. Concepts with Rating of 4.

224. The key note of child health is prevention

225. Everyone should know what to do when someone is hurt

226. Sunstroke can be avoided by keeping the head covered and by avoiding long exposure to direct sunlight during hot weather

227. It is dangerous to rub a frozen part or to warm it too quickly

228. Promiscuous spitting spreads disease and should be avoided

229. Anti-toxin cures diphtheria and tetanus if taken in time

230. Diphtheria is one of the most dangerous diseases for small children

231. X-ray is used to tell if tuberculosis has caused damage to the lungs

232. Children of tuberculous parents contract tuberculosis because of exposure

233. Scarlet fever is a dangerous disease because it may cause deafness, weak heart, or other defects

234. Even normal children occasionally show some aggressive behavior

235. In regions where the soil has low iodine content, people may develop swellings in the neck called goiters

236. Gastric juice comes from the cells lining the stomach and starts the digestion of protein food

237. Foods highly seasoned are apt to irritate the lining of the stomach

238. Pasteurized milk is safer to drink and will keep longer than raw milk

239. Voluntary muscles never work unless they are called into action by the nerves

240.. Carbon dioxide like oxygen is part of the air and is necessary for plants and animals

241. Heat will relax the blood vessels of the dermis while cold will contract them

242. Injury to the eardrum causes pain and sometimes interferes with hearing

243. The hard of hearing child usually rates lower in leadership and is much less aggressive than a normal hearing child

244. Cross eyes may be corrected if the patient and his doctors cooperate completely

245. Diseased and enlarged adenoids and tonsils should be removed

246. X-rays should be made periodically to detect small cavities in the teeth

247. Since the openings from the sinus into the nose are not large, they may become blocked up and cause a painful and serious infection

VIII. <u>Concepts with Rating of 3</u>.

248. Colds are caused by germs called viruses

249. Sulfanilamide is a successful drug for some types of pneumonia

250. The diet of the child is very important in the prevention of tuberculosis

251. The child handicapped with cerebral palsy expends a great deal more energy than the normal youngster, and in consequence tires more easily

252. Hookworm disease causes a tired, lazy feeling and in severe cases seriously interferes with growth

253. Rheumatic fever affects the heart muscle and valves and, as a result the heart is weakened and often enlarged

254. Cancer is not hereditary or contagious

255. Mechanical aids to breathing are part of the equipment of all big hospitals today

256. The Schick test determines whether or not a person will get diphtheria if the diphtheria bacterium gets into the body

257. The Federal Government carries on many surveys to aid the sick and injured

258. The necessity for Wood's Light examination in the schools, both for diagnosis and follow-up is established beyond question

IX. Concepts with Rating of 2.

259. A person is said to be in good health when his body and mind work harmoniously, so that the whole organism is capable of adapting itself to the demands made upon it by society

260. The prevention of unnecessary deaths from accidents demands a continuous campaign of education against carelessness and thoughtlessness

261. In case of suffocation time is a vital factor and immediate action is necessary

262. The diabetic child should always be taught to take care of himself

263. Hay fever and other similar diseases are due to allergies

264. Ultra-violet light is helpful because of its ability to kill many pathogenic bacteria

265. When a person has had diphtheria and makes his own antitoxin he is immune to diphtheria

266. Quinine cures the symptoms of malaria

267. The bacteria that cause tuberculosis are rod-shaped and are called tubercle bacilli.

268. A high white blood count indicates that the body is trying hard to defend itself against invading bacteria

269. In the treatment of pneumonia serums have been used with good results

270. Poisonous substances called toxins are formed by the

growth of certain germs, both inside and outside the body

271. There are three major forms of bacteria

272. The tuberculin test is a diagnostic test to determine whether a person has or has had tuberculosis

273. A vaccine prevents disease and an immune serum helps to cure disease

274. Wearing shoes is the biggest safeguard against hookworm

275. The color of the skin comes from the pigment in the deep layers of the epidermis

276. The greatest danger to the ear is an infection in the middle ear

277. When a person has a cold or sore throat the infection may spread to the ears by way of the eustachian tube

278. Most children with tuberculosis show no symptoms of illness

279. When infantile paralysis is present in a community any child with the slightest symptoms of a cold or fever should be given the most careful study by a physician

280. Measles and German measles are two different diseases and the one provides no protection against an attack by the other

281. Exposure to cold is an inciting factor in many cases of pneumonia

282. Acute infectious diseases of the upper respiratory tract

are the chief inciting causes of pneumonia in children

283. Influenza and other diseases may result in chronic middle ear disease

284. Cardiac involvement is one of the most common manifestations of acute rheumatic fever

285. The commonest heart disorder of childhood is rheumatic heart disease

286. The school program should be modified to suit the needs of a child with heart disease

287. Malaria is caused by tiny animals parasites and is carried from person to person by mosquitoes

288. Vaccines can prevent whooping cough in small children

289. Rocky Mountain spotted fever could be completely eradicated were it possible to dispose of insect vectors of the disease

290. Sanatorium treatment for tuberculosis consists largely of rest, fresh air, good food, and drugs

291. Hemophilia is a disease of blood platelets which prolongs clotting time

292. There are three accepted treatments for cancer - surgery, X-ray, and radium

293. The attitudes of parents play a major role in the development of a child's personality

294. Care of mentally deficient children is institutional, as average homes are physically, socially, and

economically unable to cope with them

295. Good eating habits are essential for healthy children

296. Pellegra, a disease that brings about sore mouths and flaming skin rashes is an example of a food deficiency disease

297. Saliva helps to digest carbohydrates

298. The heredity of color-blindness has been worked out, and it may serve as a pattern for virtually all of the other sex-linked traits

299. An important reason for having a thorough health examination every year is to discover foci of infection

300. Hearing is tested in the schools by such tests as: the whisper test watch test or by the audiometer

301. Removal of tonsils and adenoids is one way to prevent continued trouble with the middle ear and mastoid

302. Methods of avoiding dust in working conditions can reduce the number of cases of silicosis

303. Growing up is a process of interaction between the child and the environment

304. Germs may pass through a broken eardrum and cause trouble inside the ear

305. The Snellen Chart is useful in testing vision

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[5] This list is arranged in rank order, according to summation of median of two independent juries of experts.

Concepts of Health Education classified for teaching purposes.[6]

I. Healthy Living

1. Only a healthy child can realize the maximum value from school experience (10)
2. Avoidance of infection is the best protection against disease (10)
3. The health of every part of the body depends on the health of the whole body (9)
4. All living things are made up of cells (8)
5. Right habits of living improve the general health of the body (8)
6. A knowledge of the body, its duties and its care gives us the groundwork for a program of healthy living (7)
7. Poor color, flabby flesh, or skin eruptions indicate an unhealthy condition and may be the symptoms of disease (7)
8. The key note of child health is prevention (4)
9. A person is said to be in good health when his body and mind work harmoniously, so that the whole organism is capable of adapting itself to the demands made upon it by society (2)

II. Growth and Development

10. Children like to grow (10)
11. Children are expected to grow (10)
12. Regular gain in weight is a sign of health (10)
13. For human beings, growing up means growing in strength as

well as size (10)

14. Sunshine is good for all growing boys and girls (10)
15. Sickness sometimes slows growth (10)
16. Bones become longer and stronger as the body grows (10)
17. Rest helps children to grow (9)
18. Growth is marked by fluctuations in pace (8)
19. Growth is rapid at some ages and slow at others (8)
20. Each child is an individual with his own growth and health patterns (8)
21. There are many differences in height and weight of children of the same age (6)
22. Growing up is a process of interaction between the child and the environment (2)

III. <u>Safety and First Aid</u>

23. Safety rules and signs are needed to protect children from accidents (10)
24. Children who are careful are seldom hurt (10)
25. Careful boys and girls find safe places in which to play (10)
26. The fire drill teaches children how to leave the school building safely in case of fire (10)
27. The fireman teaches children to stay away from fires and matches (10)
28. It is best to stay out of water for at least an hour after eating (10)
29. Boys and girls must play carefully on the playground (10)

30. Fires must have air or they will not burn (10)
31. Children should always follow the safest way to and from school (10)
32. One way to avoid accidents in the home is to keep things where they belong (10)
33. A good swimmer always finds out whether there are any rocks or deep holes or other dangerous places to look for in a new swimming place (10)
34. Policemen help children on the way to school (10)
35. Children must play safe when skating and sliding (10)
36. Hard bumps on the head are sometimes dangerous (10)
37. Children should stay away from strange animals (10)
38. Children should learn to recognize poisonous plants and to avoid them (10)
39. Cuts and scratches may be dangerous and should be cared for right away (9)
40. Most falls come from carelessness (8)
41. It is not safe for children to play with sharp tools or machinery
42. Nothing in a first aid kit should be poisonous except tincture of iodine (8)
43. Poisons should be kept where children cannot get hold of them (8)
44. Resting when you are tired is a safety precaution because it saves the body from strain and over-fatigue (7)

45. Bad accidents in camping are usually caused by guns, falls, fire, and water (7)

46. A dog bite may carry rabies to children (7)

47. A safety council helps children to prevent accidents (6)

48. Most lives are lost in fires because no preparation has been made for the emergency and the people involved do not know how to act (6)

49. Severe bleeding must be checked quickly or death soon follows (5)

50. A good driver obeys the traffic rules and regulations (5)

51. Everyone should know what to do when someone is hurt (4)

52. Sunstroke can be avoided by keeping the head covered and by avoiding long exposures to direct sunlight during hot weather (4)

53. It is dangerous to rub a frozen part or to warm it too quickly (4)

54. The prevention of unnecessary deaths from accidents demands a continuous campaign of education against carelessness and thoughtlessness (2)

55. In case of suffocation time is a vital factor and immediate action is necessary (2)

56. The diabetic child should always be taught to take care of himself (2)

IV. <u>Bacteria, Viruses and Immunity</u>

57. All boys and girls should be vaccinated against smallpox,

diphtheria, tetanus, and whooping cough (10)

58. Flies and mosquitoes may carry disease (9)

59. Most pathogenic bacteria grow best in dark, warm, damp places (9)

60. There is no vaccine that guarantees immunity to colds (8)

61. The eyes, ears, nose, mouth, and skin are avenues through which germs may enter the body and cause disease (7)

62. Pollen allergy can be detected by skin tests (6)

63. Promiscuous spitting spreads disease and should be avoided (4)

64. Anti-toxin cures diphtheria and tetanus if taken in time (4)

65. Colds are caused by germs called viruses (3)

66. Sulfanilamide is a successful drug for some types of pneumonia (3)

67. Hay fever and other similar diseases are due to allergies (2)

68. Germs may pass through a broken eardrum and cause trouble inside the ear (2)

69. Ultra-violet light is helpful because of its ability to kill many pathogenic bacteria (2)

70. When a person has had diphtheria and makes his own anti-toxin he is immune to diphtheria (2)

71. Quinine cures the symptoms of malaria (2)

72. The bacteria that cause tuberculosis are rod-shaped

and are called tubercle bacilli (2)

73. A high white blood count indicates that the body is trying hard to defend itself against invading bacteria (2)

74. In the treatment of pneumonia serums have been used with good results (2)

75. Poisonous substances called toxins are formed by the growth of certain germs both inside and outside the body (2)

76. There are three major forms of bacteria (2)

77. The tuberculin test is a diagnostic test to determine whether a person has or has had tuberculosis (2)

78. A vaccine prevents disease and an immune serum helps to cure disease (2)

V. Cleanliness

79. The school fountain must be clean for children (10)

80. Animals that are not clean do not belong in the house (10)

81. Clean hands and bodies are safeguards against disease (10)

82. Baths with warm water and soap are indispensable if the skin is to be kept in good condition (10)

83. In order to be healthy, children must wash their hands and faces before eating and wash their hands after going to the toilet (9)

84. A warm bath before bedtime induces sleep in children (8)

85. Children should breathe only clean fresh air (8)

86. The skin regulates body heat, protects tender parts beneath, and give us our sense of touch (8)

87. Dirty feet are good growing places for the mold that causes athletes foot (6)

88. Feeling clean may help children to sleep well (5)

89. Wearing shoes is the biggest safeguard against hookworm (2)

90. The color of the skin comes from the pigment in the deep layers of the epidermis (2)

VI. <u>Infectious and Parasitic Diseases</u>

91. Colds are catching (10)

92. Measles are catching (10)

93. Children who cover their noses and mouths when they sneeze or cough protect others (10)

94. Head lice are carried from one person's head to another's by hats, combs, and brushes (10)

95. A sore throat may be the first sign of a cold or of some children's disease (10)

96. A cold that is neglected may spread and cause serious infection (10)

97. Impetigo and scabies are communicable (10)

98. In order to prevent colds children should cover their noses and mouths with handkerchiefs when they sneeze (10)

99. There are three serious diseases that one need not have today because of vaccination: smallpox, diphtheria,

and typhoid fever (9)

100. Whooping cough is a dangerous disease caused by bacteria (8)

101. Pinkeye is a catching disease caused by germs (8)

102. A dog bite may carry rabies to children (8)

103. Whooping cough is very catching from the first day when a person seems to have a slight cold until he stops coughing after four weeks (8)

104. Chickenpox lesions occur as tiny water blisters that rupture easily and may cause pitting of the skin (8)

105. Dust clogs the hose, irritates the throat and may predispose to colds (7)

106. Children with rheumatic heart disease commonly exhibit a murmur, which is a hissing or blowing sound heard with the stethoscope (6)

107. Common ailments such as headache, sore throat, running eyes, nausea, and fever may be early symptoms of a communicable disease (6)

108. A carrier of disease harbors germs in his body without being sick himself (6)

109. The hookworm is a tiny worm that gets into the body by way of the skin of the foot and causes disease (5)

110. Tetanus may follow any wound, even one which seems trivial, but particularly those that are deep, lacerated, and contaminated with dirt (5)

111. Diphtheria is one of the most dangerous diseases for small children (4)

112. X-ray is used to tell if tuberculosis has caused damage to the lungs (4)

113. Children of tuberculous parents contract tuberculosis because of exposure (4)

114. Scarlet fever is a dangerous disease because it may cause deafness, weak heart, or other defects (4)

115. Since the openings from the sinus into the nose are not large, they may become blocked up and cause a painful and serious infection (4)

116. The diet of the child is very important in the prevention of tuberculosis (3)

117. The child handicapped with cerebral palsy expends a great deal more energy than the normal youngster, and in consequence tires more easily (3)

118. Hookworm disease causes a tired, lazy feeling and in severe cases seriously interferes with growth (3)

119. The greatest danger to the ear is an infection in the middle ear (2)

120. When a person has a cold or sore throat the infection may spread to the ears by way of the eustachian tube (2)

121. Most children with tuberculosis show no symptoms of illness (2)

122. When infantile paralysis is present in a community any

child with the slightest symptoms of a cold or fever should be given the most careful study by a physician (2)

123. Measles and German measles are two different diseases and one provides no protection against an attack by the other (2)

124. Exposure to cold is an inciting factor in many cases of pneumonia (2)

125. Acute infectious diseases of the upper respiratory tract are the chief inciting causes of pneumonia in children (2)

126. Influenza and other diseases may result in chronic middle ear disease (2)

127. Cardiac involvement is one of the most common manifestations of acute rheumatic fever (2)

128. The commonest heart disorder of childhood is rheumatic heart disease (2)

129. The school program should be modified to suit the needs of a child with heart disease (2)

130. Malaria is caused by tiny animals parasites and is carried from person to person by mosquitoes (2)

131. Vaccines can prevent whooping cough in small children (2)

132. Rocky Mountain spotted fever could be eradicated were it possible to dispose of insect vectors of the disease (2)

133. Sanatorium treatment for tuberculosis consists largely of

rest, fresh air, good food, and drugs (2)

VII. Heart and Circulation

134. Red blood cells carry oxygen to all parts of the body and white cells are guards against disease (9)

135. The heart beats faster in children than in adults (8)

136. A healthy heart works much better if it has sufficient rest (8)

137. Circulation of the blood to the extremities is influenced by cold weather (7)

138. Blood vessels consist of three types - arteries, veins, and capillaries (6)

139. When a person is at rest, the pulse rate is usually about 70 beats per minute (5)

140. The brain more than any other part of the body needs a constant supply of blood (5)

141. Rheumatic fever affects the heart muscle and valves and as a result the heart is weakened and often enlarged (3)

142. Hemophilia is a disease of blood platelets which prolongs clotting time (2)

VIII. Cancer

143. Cancer is not hereditary or contagious (3)

144. There are three accepted treatments for cancer - surgery, X-ray, and radium (2)

IX. Dental Health

145. Good teeth are keys to health (10)

146. The dentist helps children to care for their teeth (9)

147. Good food helps teeth to grow strong, makes them hard and solid, and prevents aching (9)

148. Poisons from decayed teeth may be carried by the blood to other parts of the body (7)

149. Six year molars are important because they grind food during the time that the children's temporary teeth are being replaced with permanent ones (6)

150. Irregularly placed teeth should be corrected during childhood by a competent dentist called an "orthodontist" (5)

151. X-rays should be made periodically to detect small cavities in the teeth (4)

X. Mental Health

152. Nerve endings in the skin give the sensations of touch, heat, cold and pain (9)

153. Information concerning sex should be given in reply to a child's question (8)

154. The nervous system makes it possible for muscles in many different parts of the body to work together for a common purpose (6)

155. Even normal children occasionally show some aggressive behavior (4)

156. The attitudes of parents play a major role in the development of a child's personality (2)

157. Care of mentally deficient children is institutional, as average homes are physically, socially, and economically unable to cope with them (2)

XI. <u>Food and Nutrition</u>

158. Milk is the best food for boys and girls (10)

159. Tea and coffee are not good drinks for children (10)

160. Water is essential to life (10)

161. On a cold day it is best to eat a warm lunch (10)

162. Foods are the principal building materials of the body (10)

163. Food should be protected from flies as they may spread disease from person to person (10)

164. Boys and girls must eat good food and drink water every day in order to stay alive and grow (9)

165. Food and milk will keep longer if they are kept cold (9)

166. Various foods are necessary to prevent certain diseases (9)

167. In planning meals for a day, it is necessary to make sure that you have enough of all the food materials which the body needs for energy, building and repair and health protection (9)

168. The best milk comes from healthy cows (9)

169. Fruit has a place in every meal (9)

170. A good appetite is a sign of health (9)

171. Healthy people like to eat (9)

172. Sugar is a good energy food because it is digested quickly and supplies energy at once (9)

173. It is not wise to include too much sugar in the ordinary diet because sugar satisfies the hunger and destroys the desire for other essential foods (8)

174. Good meals include some rough food which forces waste from the food tube within the body (8)

175. Cod-liver-oil helps to keep boys and girls healthy and to prevent colds and rickets (8)

176. It is not good to eat between meals (8)

177. Only fresh water is good to drink (8)

178. Unless proper care is taken foods will spoil and become unfit to eat (8)

179. Disease germs grow readily in milk and may cause sore throat, scarlet fever, diphtheria, and typhoid fever (8)

180. Iron helps to give blood its red color (8)

181. Malnutrition causes a person to tire easily and it weakens body resistance to disease (8)

182. Raw fruits and vegetables must be washed clean before eating (7)

183. Inside the body foods are changing into simpler forms that can be used for fuel or for the growth and repair of cells (7)

184. The sudden loss of appetite in a normal child usually indicates acute illness (7)

185. Lack of sunlight may cause bones to become weak (7)

186. Vitamins are substances found in certain foods that are

needed for health and growth (7)

187. A good breakfast will help children to keep warm on cold mornings (6)

188. Lime is essential for building healthy bones and teeth (6)

189. Vegetables and fruits lose vitamins in cooking (6)

190. Fresh vegetables and fruits protect the body against scurvy (5)

191. The liver is a storehouse for fuel that the body uses for the production of energy and heat (5)

192. Calcium and phosphorous are two important minerals necessary for the growth of bones and teeth (5)

193. A healthy stomach is a disinfecting station of great value (5)

194. Pork should always be thoroughly cooked to prevent the painful disease called trichinosis (5)

195. Good eating habits are essential for healthy children (5)

196. Foods highly seasoned are apt to irritate the lining of the stomach (4)

197. Pasteurized milk is safer to drink and will keep longer than raw milk (4)

198. In regions where the soil has low iodine content, people may develop swellings in the neck called goiters (4)

199. Gastric juice comes from the cells lining the stomach and starts the digestion of protein food (4)

200. Pellegra, a disease that brings about sore mouths and

flaming skin rashes is an example of a food deficiency disease (2)

201. Saliva helps to digest carbohydrates (2)

XII. <u>Sleep and Rest</u>

202. Children who are ill should rest in bed (10)

203. After playing, children need rest (10)

204. The younger you are the more rest you need (10)

205. Sleep and rest are natural ways by which the body restores its strength and power (10)

206. The amount of sleep needed depends partly on the person's age, the amount of exercise he takes and his general health (10)

207. A regular hour for going to bed and getting up encourages sound sleep (10)

208. Sleep rests every part of the body and helps it to get ready for the next day's work and play (10)

209. Good sleeping habits will help a person to get the most of sleeping hours (8)

210. Children who have colds should stay in bed (8)

211. The body builds itself up while resting (8)

212. A rested body is better able to defend itself against harmful germs than is a tired body (8)

213. Children need appropriate rest at different intervals (7)

214. Children must prepare for bedtime in order to go to sleep quickly (7)

215. Sleep and rest, good meals at regular times, exercise and fresh air, are the best helps to healthy nerves and the brain (6)

216. Overwork and over fatigue when accompanied by little rest and sleep form a combination of factors that weaken the body's resistance to disease (5)

XIII. Posture and Exercise

217. The right kind of exercise trains the muscles and makes them strong (10)

218. Play and exercise every day help the body to get rid of wastes (10)

219. Exercise makes muscles tired and rest or sleep will help build them up (10)

220. Play and exercise improves the appetite and digestion (10)

221. Swimming is an exercise which brings into play every muscle of the body (10)

222. Proper posture allows all the body organs to do their best work (10)

223. Good posture is a sign of health (9)

224. The tone of the whole body is improved by exercise (9)

225. Good posture helps children keep well and strong (8)

226. Posture is important in building a good framework for the body (8)

227. A good sitting position helps blood to circulate (8)

228. Exercise increases the rate of breathing and also makes

the heart beat faster (7)

229. Anything that helps make children strong and healthy, helps them have good posture (6)

230. A straight framework is necessary if bodies are to attain their greatest strength (6)

231. Proper rest after vigorous exercise is necessary in order to get rid of lactic acid (6)

232. Good posture should be a habit (5)

233. Chest expansion should increase with growth (5)

234. Voluntary muscles never work unless they are called into action by the nerves (4)

XIV. Recreation and Play

235. Recreation helps children to grow to be strong and to be healthy (10)

236. In general, summer camp is a marvelous experience for the average healthy child (8)

237. Good physical education in school lays a foundation for happy, healthful adult recreation (6)

XV. Elimination of Wastes

238. A child should go to the toilet to get rid of wastes whenever he feels the need (9)

239. Cereal and bread made from whole grains help people to have a bowel movement every day (8)

240. Wastes in the large intestines are the parts of food that the body cannot digest (8)

241. The large intestines can be trained to clear themselves of waste material without the aid of medicines (8)

242. Perspiration keeps the body cool and carries off waste materials (8)

243. The wastes produced by working cells are picked up by the blood and carried to the kidneys for removal (7)

XVI. Clothing

244. Warm clothes prevent heat from leaving the body (10)

245. Clothes must be worn according to the season of the year (10)

246. Rubbers and raincoats should be removed when indoors, because they do not give the body a good chance to breathe (10)

247. The clothing you wear helps to keep the body at the right temperature (9)

248. Clothes should fit the weather as well as the person wearing them (9)

249. Wet clothes make the skin cold and may cause sickness (8)

250. Children's clothing should be light, loose and easy to clean (6)

XVII. Light and Air

251. Good light is essential for good reading (9)

252. When the thermometer says 70 degrees, the air is just about right (8)

253. All living things use air in some way (8)

254. The skin protects the body from heat and cold (8)

255. Steady quiet breathing shows that a person is taking air into the lungs that is needed to keep the blood stream supplied with good fresh oxygen (8)

256. Air should enter the body through the nose rather than through the mouth because the nose is better equipped to prepare air for the lungs (8)

257. Mold grows without sunshine and spoils food (6)

258. As long as the body is well and healthy the body temperature remains almost constant (6)

259. Carbon dioxide like oxygen is part of the air and is necessary for plants and animals (4)

260. Heat will relax the blood vessels of the dermis while cold will contract them (4)

XVIII. Vision and Hearing

261. Earache is a sign of trouble and should get prompt attention (10)

262. A person who is color blind cannot tell which things are colored green, and which are colored red (8)

263. Good eye sight is essential in the development of a healthy child (6)

264. The structure of the eye is like that of a camera (5)

265. Air which is set into motion by vibrations produces sound waves (5)

266. It is a poor practice to place objects in the ear (5)

267. Injury to the eardrum causes pain and sometimes interferes

with hearing (4)

268. The hard of hearing child usually rates lower in leadership and is much less aggressive than a normal hearing child (4)

269. Cross eyes may be corrected if the patient and his doctors cooperate completely (4)

270. The heredity of color-blindness has been worked out, and it may serve as a pattern for virtually all of the other sex-linked traits (2)

XIX. Health Service.

271. The doctor cares for children when they are ill (10)

272. The school nurse gives children first aid and helps them with their health needs (10)

273. Children should be vaccinated before they go to school (10)

274. The first essential of healthy school living is to keep the classroom clean (9)

275. A podiatrist treats simple diseases of the feet (8)

276. The health examination is the first step in any sound health program (8)

277. An oculist examines children's eyes and prescribes glasses (7)

278. The American Red Cross teaches people how to give first aid (7)

279. The sounds which come through the stethoscope tell the doctor whether or not a person's heart and lungs are working properly (7)

280. A doctor has many special ways of finding out whether the body is as healthy as it can be (7)

281. Doctors believe that people can do some things to give their bodies the best chance to resist colds (6)

282. Speech quality of the voice can be improved (6)

283. A health examination every year helps a person to keep well and strong (5)

284. The safest procedure to follow when there is pain in the abdomen is to stay in bed and call a doctor (5)

285. Diseased and enlarged adenoids and tonsils should be removed (4)

286. Mechanical aids to breathing are part of the equipment of all big hospitals today (3)

287. The Shick test determines whether or not a person will get diphtheria if the diphtheria bacterium gets into the body (3)

288. The Snellen Chart is useful in testing vision (3)

289. The Federal Government carries on many surveys to aid the sick and injured (3)

290. The necessity for Wood's Light examination in the schools, both for diagnosis and follow-up is established beyond question (3)

291. Removal of tonsils and adenoids is one way to prevent continued trouble with the middle ear and mastoid (2)

292. Hearing is tested in the schools by such tests as: the

whisper test, watch test or by the audiometer (2)

293. An important reason for having a thorough health examination every year is to discover foci of infection (2)

XX. Community Health

294. Dirty garbage and manure breed flies (10)

295. Health officers quarantine people who are sick with certain diseases in order to prevent the spread of disease (10)

296. A good place to live must be warm and dry (9)

297. Good housing is necessary for good health (8)

298. Towels and wash basins in public washrooms or other public places are sources of infection (8)

299. The State Board of Health tests and approves food and water (8)

300. The food inspector guards the public health by making sure that food sold in the stores is clean and fresh and carries no germs (8)

301. Health Departments are interested in preventing and controlling communicable diseases (8)

302. Drinking water which is not pure may cause disease (7)

303. The use of filters and chlorine keeps the city water supply clear and pure (6)

304. Proper disposal of wastes is important in preventing typhoid fever (6)

305. Methods of avoiding dust in working conditions can reduce the number of cases of silicosis (2)

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[6] This list is arranged in logical order for teachers' purposes and by rank order in each indicated area.

CHAPTER V

THE SUMMARY AND CONCLUSIONS

Summary of the Study. In brief review the purpose of the study was to determine from several different sources fundamental concepts of health education that are of functional value to the elementary school. The research procedures and techniques used in the study may be summarized chronologically as follows:

Thirty-six health textbooks, designed for use at the elementary school level, were analyzed for concepts of health education.

Fourteen safety textbooks, designed for use at the elementary school level, were analyzed for concepts of health education.

Thirty-six issues of Hygeia were analyzed for current concepts of health.

Vital statistics of the National Office of Vital Statistics, United States Public Health Service were analyzed, and accidents were consistently the number one killer of children of ages 5-14.

Analyzed "Accident Facts," the official publication of the National Safety Council, for additional facts and specifics about accidents of age-span 5-14. Made out check list.

Studied other vital statistics and made out check list of first five killers according to etiology, portals of entry, and prevention and control.

Checked accident and mortality check list against list of concepts derived from other sources and whereever necessary supplemented the list of concepts.

Submitted completed lists of concepts to first jury of medical and health specialists in order to establish scientific accuracy.

Revised the list according to the findings of the first jury.

Submitted corrected list to two independent juries of health and elementary school specialists for a check of teaching suitability at the elementary school level.

Conclusions. Although the major findings of this investigation and study included the identification and validation of some 305 concepts of healthful living that are of functional value in contributing to the general education of elementary school pupils, yet the analysis of the textbooks, literature, and vital statistics provided such a vast amount of significant material as to warrant due interpretation in this body of conclusions.

1. The analysis of thirty-six health textbooks, designed for use at the elementary school level, reveals a rather general disagreement among authors as to the nature of health content in general and to the method or treatment and gradation of the content in particular.
2. In most of the health series there appears to be unnecessary repetition of material at each grade level.
3. Safety material, although of utmost value to the children on this level, appears to be treated very lightly in most health texts.
4. There is no mention of sex-education in any form in any of the readers.
5. Most of the textbooks examined had some unit on the common cold or respiratory disease.
6. The examination of vital statistics revealed the major causes of deaths and sicknesses in children 5-14. It is concluded that more stress needs to be placed on these facts in making the teaching of health education at the elementary school level

functional in nature.

7. The analysis of accident facts suggested that more safety material be taught and practiced at the elementary school level.
8. Our present major problems in reducing mortality at the elementary school include:
    a. Improved programs of accident prevention.
    b. Improved public health programs and facilities for the prevention and control, diagnosis and treatment of tuberculosis.
    c. Research into the causes and control of heart diseases, poliomyelitis, and cancer.
    d. Education of the child to early recognition of the importance of health to daily living.

Implications of the conclusions. It is believed by the investigator of this study that the classified list of 305 concepts of healthful living will meet the functional needs of elementary school pupils. It is believed that the concepts will pave the way for better organization of health content in the curriculum at the elementary school.

It is not to be presumed that it will be possible to teach all the concepts even during the course of the entire six grades. It is rather based on the assumption that the teacher herself must work out her own program to meet her own particular needs.

Although based on objectively determined health needs of the school child, these concepts are flexible as to use and suggestive as to application. They are available for furnishing specific guidance to local curriculum

planners and teachers who feel the need for improving instruction in health education.

The identification and determination of concepts of healthful living represents the first step in the series of activities that lead to unit organization at the elementary school level. The list of concepts are not classified by grade level or organized into appropriate meanings, insights, and skills, for this is recommended work for other investigations and studies, but rather represent areas of learning — capacities for growth and behavior in health through which the child may be progressively guided throughout the entire course of the elementary school.

Recommendations for Further Study. Throughout the course of this study the investigator has become aware of numerous related problems in the field of health education which are well beyond the scope of this particular dissertation. The following list will indicate some of the problems that have been raised in the mind of the present investigator and are offered as recommendations for further study and research.

1. It is recommended that each concept of healthful living identified for use at the elementary school level be broken down into suitable insights, skills, habits, and appreciations.
2. It is recommended that appropriate units be organized around each concept.
3. It is recommended that the list of concepts be graded, according to acceptable criteria, for each age level in the elementary school.
4. It is recommended that suitable demonstrations be determined to scientifically demonstrate the identified concepts.

5. It is recommended that this study be compared to the study by Staton at the secondary school level in order to prevent any possible duplication of material and to lay the foundation for a total course of study for the entire twelve grades.
6. It is recommended that similar studies be conducted at the pre-school and college levels.
7. It is recommended that vocabulary studies be made at each grade level in the elementary school in order to determine suitable reading materials.
8. It is recommended on the basis of this particular investigation that textbooks in health education for the elementary school level be written based on the findings of this study and the philosophy of the unit method.

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APPENDIX

APPENDIX A

INSTRUCTION SHEET FOR EVALUATING CONCEPTS

1. The enclosed list indicates some 305 concepts of health education that the investigator believes may be of functional value to the elementary school.

2. The purposes, sources of information, and research procedures are clearly set forth in the enclosed papers, "An Outline of a Proposed Doctoral Research Problem". This is enclosed to inform the jury member of the nature of the problem.

3. The concepts have already been validated by a selected jury of medical and health specialists and may be considered on this basis as being scientifically accurate.

4. It is the desire of the investigator to submit this list of concepts to two independent juries of subject matter and elementary school specialists, who _will rate each concept on the basis of its suitability as a concept of health education at the elementary school level_. The concepts represent teachers goals and will eventually form a basis for unit organization at this level.

5. The following scale will be used:

5 - Ideally suited
4 - Well suited
3 - Neither well nor poorly suited
2 - Poorly suited
1 - Not at all suited

In order to meet rating 5 in the list the concept must be ideally suited for teaching purposes and must ideally suit both the health needs and interests of the elementary school pupils. Four represents a concept that

adequately suits the health needs of pupils without satisfying the interests of the pupils. Three represents a concept that adequately suits the health interests of pupils without satisfying the health needs of the pupil. Two represents a concept that does not adequately meet either the health needs or the interests of pupils. One represents a concept that is not at all suitable for teaching purposes at the elementary school level.

6. The jury member is instructed to place a discrete number of 1-5, depending on _its suitability as a concept of health education at the elementary school level_, after the stated concept on the list.

7. Although it is absolutely essential to rate the concepts on the basis of the stated criterion, yet feel free to make any comments, suggestions or criticisms of anything that may be apparent in the study.

APPENDIX B

AN OUTLINE FOR A PROPOSED DOCTORAL RESEARCH PROBLEM

I. Tentative Title:
"A Determination of Health Concepts which are of Functional Value for the Elementary School"

II. Selection of the problem:

A. Source: There exists a very definite need for functional health concepts or principles that will one day become the foundation for health instruction in the Elementary School. The investigator is aware of parallel studies in the field of Science Education and the study recently completed by Staton on the Secondary level. But after considerable study and review of the literature it has become apparent that comparatively little research in Health Education has been completed at the Elementary School level.

B. Justification: An examination of the age-span of the Elementary School child will reveal it to be a period of growth and development subject to certain very definite hazards to health and safety which may very well be a hinderance to this future well-being and happiness. This is the age when the passive immunity of placental transmission has become depleted and the child becomes subject to communicable disease. This is the age for active immunization and the time for the establishment of proper health habits and attitudes.

The investigator is keenly aware of the words of Chenoweth and Selkirk, who in their text, "School Health Problem" adequately summarize

(1) a justification of the problem
(2) one method of selecting facts for health instruction

"A new examination of the facts now taught needs to be made in order to see what is omitted that should be taught, to relegate to the proper places those things that are of minor importance and to eliminate the things that are not true. Some of the things now taught do not have health value in keeping with the prominent place they occupy in teaching.

"A very different approach lies in the consideration of the subjects of death and sickness for the uncovering of materials suitable for teaching. The causes of death and sickness are of major importance to the health of the nation. An examination of them should be made as a means of selecting facts to be taught."

C. Scope: This study is concerned with the determination of concepts of health education which are of functional value to the elementary school.

The investigation is limited to the elementary school grades I through VI. The study will attempt to crystallize current health information selected from several authoritative sources into a set

of well organized and classified concepts which might serve as a basis for health instruction at the elementary school level.

III. Research procedures and techniques:

A. Logical Analysis: The problem may be divided into two major parts, the inductive phase and deductive phase.

1. Inductive Phase - the purpose of this phase will be to determine the list of concepts of health education.
    - Sub-Problem (a) - to select and determine important concepts of health education from an analysis of Morbidity and Mortality statistics.
    - Sub-Problem (b) - to select and determine the important concepts of health education occurring in 34 textbooks (6 series) designed for use in the elementary school.
    - Sub-Problem (c) - to select and determine the important concepts of health education occurring in 14 selected safety texts and readers.
2. Deductive Phase - the purpose of the deductive phase of the study will be the determination of those concepts, from the list secured in the inductive phase, which are of importance as concepts of the elementary school.
    - Sub-Problem (a) - to determine from the ratings and judgments of selected medical and health authorities the accuracy of the concepts as determined in the inductive phase.
    - Sub-Problem (b) - to determine from the rating and judgments of selected medical, health, and elementary school specialists, which concepts contained in the list derived from the inductive phase are essential, as fundamental concepts for health instruction in the elementary school.

B. Research Procedure: Techniques to be used in obtaining the necessary data.

1. Inductive Phase:
    - Sub-Problem (a) - The most recent vital statistics (Mortality and Morbility) as reported by the United States Public Health Service will be analyzed and tabulated for ages 6-12. The predisposing and immediate causes of the sickness and deaths listed will be established wherever possible, and prevention and control will be stressed. Fundamental concepts of health education will be derived from the findings, the accuracy of which will later be substantiated by a committee of authorities.
    - Sub-Problem (b) - The content of 34 current and authoritative health texts designed for use at the elementary school level will be read and analyzed for statements of basic concepts of health education. Criteria for selection of textbooks include:
        1. Up to date (1940-)
        2. Authoritative (Authors position and background)
        3. Part of health safety series (especially designed)

Sub-Problem (c) - the content of 14 up to date and authoritative safety texts designed for use at the elementary level will be read and analyzed for statements of basic concepts. Criteria for selection of the readers are the same as those listed under Sub-Problem (b).

After the principles have been derived from the three indicated sources, the statements will once again be checked by the investigator for conformance to the criteria for the concept of health education and for any possible duplication that may exist. The concepts will then be organized into a proper classification based on the findings of the investigation.

2. Deductive Phase:

Sub-Problem (a) - the organized list of classified concepts will be submitted to a selected committee of health and medical authorities who will consider the concepts from a standpoint of scientific accuracy consistent with current medical research, the committee will consist of five members and will include:

1. Pathologist - (Possess M.D. degree - Member of Path. Society)
2. Pediatrician - (Possess M.D. degree - Member of Pediatric Society)
3. Health Specialist - (Possess Ph.D. degree - Qualified health specialists) (two)
4. Vital Statistician - (Possess Ph.D. - Qualified Vital Statistician)

Sub-Problem (b) - the list of concepts will then be submitted to two independent committees of experts who will consider and judge their suitability as fundamental concepts for health education at the elementary school level in line with the stated criteria.

These committees or juries will each consist of five members:

1. Subject matter specialist (Health)
2. Health supervisor of Elementary School level.
3. Safety Education expert.
4. Specialist in Elementary Curriculum.
5. Health Teacher

The juries will evaluate each concept numerically in accordance with the following scale:

(1) Not at all suited
(2) Poorly suited
(3) Neither well nor poorly suited
(4) Well suited
(5) Ideally suited

Sub-Problem (c) - The committee of experts will then determine the suitability and accuracy of the classification.

C. Data Needed: Data necessary for the solution of this problem will be derived from three fundamental sources:

1. Most current Morbidity and Mortality statistics as recorded by

the Bureau of Vital Statistics, United State Public Health Service.

2. The content of 34 textbooks (6 series) designed and prepared for use in grades I through VI. The following textbooks in health education are proposed by the investigator for use in this study because they satisfy the criteria as established previously.
   a. Safe and Healthy Living Series: Andres, J. H., Goldberger, L. H., Dolch, Marguerite, and Hallock, Grace, Ginn & Co., 1945.
      Title:
      - Spic and Span
      - The Health Parade
      - Growing Big and Strong
      - Safety Every Day
      - Doing Your Best for Health
      - Building Good Health

   b. Health of Our Nation Series: Brownell, C.L., and Williams, J.F., American Book Co., New York, 1942.
      Title:
      - Well and Happy
      - Clean and Strong
      - Fit and Ready
      - Safe and Sound
      - Hale and Hearty
      - Active and Alert

   c. New Health and Growth Series: Charters, W.W., Smiley, D.F., and Strong, Ruth, The MacMillan Co., New York, 1941.
      Title:
      - All Through the Day
      - Through the Year
      - Health Secrets
      - Healthful Ways
      - Lets be Healthy
      - Habits Healthful and Safe

   d. Health-Happiness-Success Series: Irwin, Leslie W., Tuttle, W.W., and Dekeluey, Caroline, Lyons and Callahan, 1947.
      Title:
      - Awake and Away
      - Growing Day by Day
      - Keeping Fit for Fun

      Bunkard, W.E., Chambers, R.L., and Mahoney, F.W., Chicago, 1943.
      Title:
      - Building for Health
      - The Body and Health
      - Health by Doing

   e. Health, Safety, Growth Series: Turner, C.E. and Colleagues: D.C. Heath Co., Boston, 1941.
      Title:

Growing Up
Keeping Safe and Well
Gaining Health
Cleanliness and Health Protection

f. American Health Series: Wilson, C.C., Bracken, J.L., Pryor, H.B., Almack, J. C., Bobbs-Merrill Co., New York, 1943.
Title:
Our Good Health
Healthy and Happy
Everyday Health
Health at Home and School
Health at Work and Play
Growing Healthfully

3. The content of 14 safety textbooks. (Two Series) designed and prepared for use in grades I-VI.

a. The Road to Safety Series: Budkley, H.M., White, Margaret L., Adams, Alice B., and Silvernale, L.R., American Book Co., Boston, 1938.
Title:
Away we Go (Book A)
Happy Times (Book B)
In Storm and Sunshine (Book C)
In Town and Country
Here and There
Around the Year
Who Travels There

b. The Safety Sam Series: Bartrug, C.M. Webster Publishing Co., St. Louis, 1943.
Title:
Meet Safety Sam
Safety Sam's Friends
Growing Up With Safety Sam
Tips from Safety Sam
Growing Wise with Safety Sam
Playing Safe with Safety Sam

D. Assumptions Made: The following assumptions must be made to provide a premise upon which the study is based.

(1) The Health and safety textbooks selected for analysis in this study are reliable, scientific, and current.
(2) The vital statistics recorded by U.S.P.H.S. are reliable and valid.
(3) The judgment and evaluation by the three selected juries may be considered as valid and reliable.
(4) The working definition of a principle health education previously stated must be accepted as being valid.

IV. Conclusion

1. The final list of health concepts may serve as a core for the instructional plan in the elementary school.

2. Improved textbooks, workbooks, demonstrations and units may be created based upon this list of principles.
3. The findings may indicate areas of "over and under" emphasis in our present day health instruction at the elementary school level.
4. Improved health habits, attitudes, and practices may result from the inclusion of more functional concepts in the health instructional program at the elementary school level.

V. Previous Studies: To the best knowledge of the investigator no previous studies of this nature have been completed at the elementary school level.

There are several investigations which have utilized similar research techniques:

1. Staton, Wesley., "A Determination of Fundamental Concepts of Healthful Living and Their Relative Importance for General Education at the Secondary Level.", Doctoral Dissertation, Boston University, 1948.
2. Craig, Gerald S., "Certain Techniques Used in Developing a Course of Study in Science for the Horace Mann Elementary School", Doctoral Dissertation, Contributions to Education, No. 276, New York Teachers' College, Columbia University, 1927.
3. Robertson, Martin L., "A Basis for the Selection of Course Content in Elementary Science.", Doctoral Dissertation, University of Michigan, 1933.
4. Martin, William E., "A Determination of the Principles of the Biological Sciences of Importance for General Education." Doctoral Dissertation, University of Michigan, 1944.

APPENDIX C

CALCULATION OF CORRELATION RATIO

JURY II

		1	2	3	4	5	FY	Y^1	FY^1	FY^{1^2}	EX^1	$(EX^1)^2$	$\frac{(EX^1)^2}{FY}$	EX^1Y^1
JURY I	5	0	1	2	15	68	86	2	172	344	150	22500	261.6	300
	4	0	4	19	54	13	90	1	90	90	76	5776	64.1	76
	3	0	18	22	3	2	45	0	0	0	-11	121	2.6	0
	2	5	26	3	0	0	34	-1	-34	34	-36	1296	38.1	36
	1	40	9	0	0	1	50	-2	-100	200	-87	7569	151.3	174
FX		45	58	46	72	84	305		128	668	92		517.70	586
X^1		-2	-1	0	1	2								
FX^1		-90	-58	0	72	168	= 92							
FX^{1^2}		180	58	0	72	336	= 646							
EY^1		-85	-38	20	84	147	= 128							
$(EY^1)^2$		7225	1444	400	7056	21609								
$\frac{(EY^1)^2}{FX}$		160.5	24.4	8.7	98.0	257.2	= 548.80							
EX^1Y^1		170	38	0	84	294	= 586							

$$\left\{\begin{array}{l} CY = \frac{128}{305} = .419 = .42 \\ C^2Y = .176 = .18 \end{array}\right. \qquad \sigma y = \sqrt{\frac{668}{305} - .18} = 2.00 = 1.41$$

$$\left\{\begin{array}{l} CX = \frac{92}{305} = .30 \\ C^2X = .09 \end{array}\right. \qquad \sigma x = \sqrt{\frac{646}{305} - .09} = 2.03 = 1.42$$

$$NYX = \frac{\sqrt{\frac{548.80}{305} - .18}}{1.41} \qquad NXY = \frac{\sqrt{\frac{517.70}{305} - .09}}{1.42}$$

$$\underline{NYX = .90} \qquad NXY = .89$$

$$r = \frac{\frac{586}{305} - (.42)(.30)}{1.41 \times 1.42} = \underline{.89}$$

APPENDIX D

CALCULATION OF STANDARD ERROR OF NYX, NXY, AND r

1. $SE_r = \frac{(1-N^2)}{\sqrt{N-1}} = \frac{(1-.89^2)}{\sqrt{305-1}} = .01$

2. $SE_r = \frac{(1-N^2)}{\sqrt{N-1}} = \frac{(1-.90^2)}{\sqrt{305-1}} = .01$

3. $\sigma r = \frac{(1-r^2)}{\sqrt{N-1}} = \frac{(1-.89^2)}{\sqrt{305-1}} = .01$

APPENDIX E

ANALYSIS OF DATA

Ratings by Individual Members of the Two Juries Compared

JURY I	Members	Ratings				
		1	2	3	4	5
	1	49	58	25	106	67
	2	50	53	34	76	92
	3	34	3	10	28	230
	4	54	44	56	70	81
	5	53	19	108	77	48
		240	177	233	357	518
JURY II						
	1	53	59	34	73	86
	2	53	54	43	61	94
	3	37	40	46	53	129
	4	41	58	57	67	82
	5	56	50	53	65	81
		240	261	233	319	472
		480	438	466	676	990

N = 3050

APPENDIX F

SUMMATION OF MEDIAN FOR FINAL RANK-ORDER

Median	Frequency
10	69
9	27
8	56
7	23
6	27
5	21
4	24
3	11
2	47
	305

Not to
Leave
Library